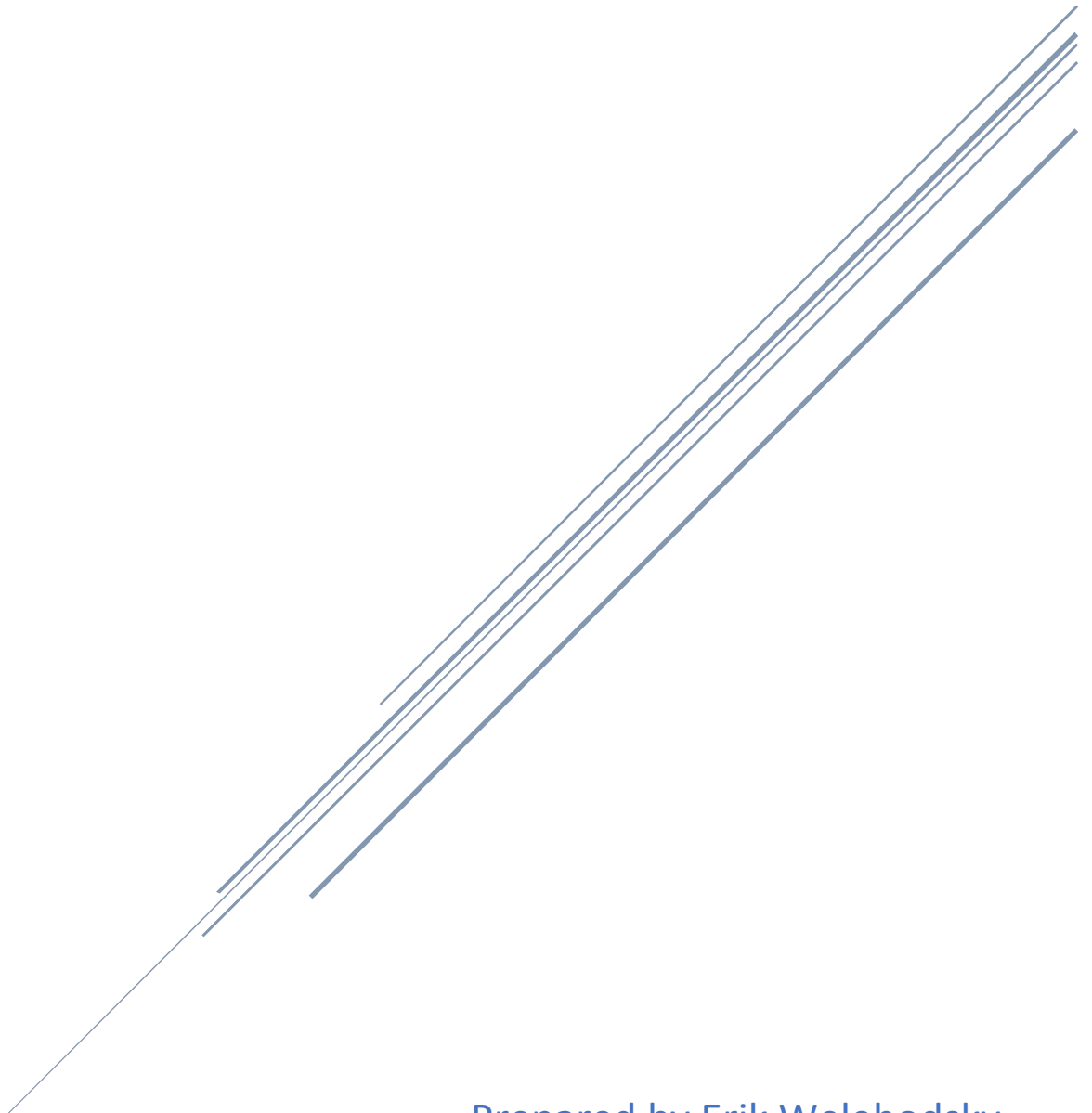


COMPUTING SOLUTIONS

For The Scions of the Seventh Dawn on December 18, 2022



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Executive Summary

This proposal contains recommendations for computing devices and services to be used by the Scions of the Seventh Dawn. Hardware offers a brief overview of the hardware needs of the company and makes recommendations on purchases. Software compares available offerings for the operating systems of the devices and makes a recommendation for use. It also contains advice on office software and videoconferencing software. Networking explores options for office network setup and available ISPs for the company. Security advises the company on the purchase of enterprise-class antivirus and a company-wide acceptable use policy on corporate data-usage.

Hardware

The Scions' business model calls for a bit of diversity in technology. Your leadership remains in the office daily, and as such should be equipped to handle various office tasks. The Emotional Support Assistant should be able to perform various work-related research as needed. Your Waste Disposal Agents will generally not be in the office for any prolonged period but should be able to document conditions in the field and process payments. Finally, your Custodian requires no device solutions.

In the Scions of the Seventh Dawn, the CEO, International Relations department, and Public Relations department are expected to handle daily work in the office. Likewise, your Emotional Support Assistant will maintain an office and be expected to have basic networking capabilities. However, these tasks will generally require minimal processing power. Therefore, I propose to equip your office staff with a series of Thin Clients connected through a virtual desktop interface to a central operational server.

Such a server will not need to be particularly graphically capable either, though it should have sufficient space for your business records, and an enterprise grade processor such as the Intel Xeon line for handling your tasks quickly and efficiently. This office server need not provide a website as I feel at your small size the Scions are better served by a third-party for development of and maintenance of a website. Since the company does deal in international business affairs with multiple private organizations, I believe instead that security and redundancy of data be prioritized. I therefore suggest the purchase of a lower to mid end dedicated server, configured in at least RAID 1 for backup. This office network will require a secure router from a trusted brand such as Cisco, though the router selected shouldn't need to be able to handle a large networking environment. Additionally, to further secure this data, I suggest the addition of a low-grade business physical firewall. This should help secure your office from attacks by outside parties and will scale nicely should your business eventually develop to one that requires internet accessible servers on-site through the creation of a DMZ layer to the network.

The Scions' Waste Disposal Agents are grouped into small units of two and three for their duties. Proper documentation of their works to be completed and progress on them could be accomplished with as little as a camera, but for consistency of user experience, proper storage of documentation, and additional functionalities I suggest the inclusion of a trusted tablet to each group. Finally, since each group must be able to receive payment, a point-of-sale device is needed for each. Several prominent options are available, including from trusted business provider Square. These should be of a small form factor and long battery life.

Based on your organization's available finances and needs, I suggest Dell Optiplex Thin Clients for their office workers. Your office internal records and work profiles can be managed by a Dell PowerEdge rack servers in RAID 1+0. This will connect to a Cisco Integrated Services router and then to a ZyXEL Security Firewall before connecting to the internet. Your company's two field groups will each carry an Apple iPad Pro and a Square Terminal point-of-sale device.

Software

Operating Systems

The operating system needs for the Scions new hardware are defined in large part by the hardware chosen. The rack servers I recommended have Microsoft Windows Server 2019 edition installed. This is an industry standard for Windows servers and has been thoroughly tested. Microsoft Windows Server 2022 is now available for purchase, but would be an expensive and, at this point, unnecessary upgrade costing over five hundred dollars per server and potentially more to virtualize users onto our Dell Thin Clients.

Additionally, it is designed for more hardware than we have budgeted for and is not nearly as thoroughly tested. Our Thin Clients for general office use will come with Dell's proprietary Dell ThinOS, and we will create virtual user accounts on our servers from them. Installing other operating systems on them is not necessary, and upgrading their pre-installed OS is beyond the scope of my services and would require a specialist. Windows Server accounts should serve the business's needs for the foreseeable future. I do recommend budgeting for an eventual upgrade to the operating system of the servers, and consideration of Linux-based services may be worth the effort if the business grows quickly. In particular, should management decide on hosting their own webserver, a well-regarded Linux distribution such as Red Hat Enterprise Linux, which would run an Apache webserver, may be worth exploring in the future.

Much of the other hardware I've recommended for your company comes with its own operating system restrictions. The ZyXEL Security Firewall will run its own embedded operating system. It includes 13 months of Unified Threat Management service. The decision on whether to renew this service after the initial trial period can be considered in the future. Similarly, the Cisco router I have recommended will run its own Cisco IOS IP Base operating system and should need nothing else. Any updates in the future would require the services of a dedicated Cisco technician. Our Waste Disposal Agents equipped with Square Terminals will also be confined to Square's proprietary OS, but it seems well-regarded among small and medium-sized businesses. The Apple iPad Pros I have recommended will, as usual, come with proprietary

Apple operating systems, in this case iPadOS 14.5. Apple is regarded as the industry leader in tablets though, and with their 128 GB SSDs they should be able to carry out the necessary recording and annotation functions through pictures with ease.

Office Software

For the Scions general office needs, a current office suite is required. Microsoft Office has long been the gold standard for such services and would be highly compatible with our Windows-based office operating systems. Should its use on our iPads be desired, it is also available on Apple systems. Licensing of Microsoft software, particularly through Windows, has always been straightforward. To avoid having to rely on web-based use, I recommend a subscription to Microsoft 365 Business Standard edition, at a cost of only \$12.50 per user, per month. This would include access to the OneDrive service for additional data backup. Additional information is available at <https://www.microsoft.com/en-us/microsoft-365/business/compare-all-microsoft-365-business-products>. Should this cost prove prohibitive, a variety of open-source office suites are available. Two of the most popular are Apache OpenOffice, and LibreOffice. Both are well-regarded, but Apache OpenOffice is known for a slower release cycle, promising no specific dates for updates, and releasing only when confirmed safe and stable. LibreOffice is more regularly updated and may be more desirable if the Scions office staff are used to cutting-edge features. Either would serve you well, though neither includes all the features available with a Microsoft 365 subscription. Information about Apache OpenOffice is available here: <https://www.openoffice.org> and information about LibreOffice is available here: <https://www.libreoffice.org>. I encourage management to test these services to determine if they are sufficient if ever needed, though since you have so few users to license, I feel like Microsoft 365 is fairly priced.

Videoconferencing Software

Since the Scions of the Seventh Dawn do engage in actively maintaining public relations and have international business, it is imperative that office employees be able to videoconference directly with customers and their intermediaries, and even the public if necessary. This is particularly fitting as many clients may still be working from home, and for those who aren't, even a company situated along national borders such as yours can't afford to travel for every meeting at your current scale. During the pandemic, Zoom has achieved widespread acclaim for its use in the education sector. This could potentially meet your needs and is available on a license per person per year basis. A standard business license does cost a not insignificant \$199.90 per user per year, however. Licensing information is available at <https://zoom.us/pricing>. One of the chief competitors to Zoom, that has seen especially large adoption among governmental agencies and non-profit organizations, is Microsoft Teams. This could fulfill all your required functionality easily, and as a bonus, is included as part of a Microsoft 365 account. By sticking to Microsoft software where applicable we could save your company a tidy margin, and I recommend this till such time as it no longer suits your needs. On the other hand, if you decide Microsoft Office is too pricey for you, Teams does not seem to presently be available outside of a Microsoft bundle. I suggest a meeting soon to discuss software deployment strategies, and whether management feels cutting costs where available is prudent. I will prepare a cost-benefit analysis on your expected savings with some of your cheaper options, but it will be up to Ms. Taru and the rest of management to determine whether any savings are worth the potential losses in productivity or compatibility.

Networking

For the Scions networking needs, we consider whether a wired or wireless network is most appropriate. If the Scions adapt a wired infrastructure, they can expect a more stable connection, as well as higher network speeds and greater security. A wireless network would offer greater mobility, and less installed infrastructure to maintain. Since your primary office will be small, and data security is a paramount concern, I suggest installing a wired network throughout the office. A wireless data plan through a cell phone provider may be an appropriate supplement for the tablet devices used by your field workers. Considering this, we will set up your field workers with the ability to wirelessly connect to the home wired network using Virtual Private Network technology.

Next, we consider available Internet Service Providers at your location of 1401 East Court Street, Flint, MI 48503. The largest ISP in the area is Xfinity. They offer a variety of speeds and price plans and charge a small hardware fee for use of their equipment. Speeds vary from an advertised 400 Mbps download speed for \$39.99 a month, to a 6 Gbps download speed for \$299.95 per month. Each requires a 2-year commitment. Regardless of choice, the equipment fee is \$14 per month. Xfinity is widely regarded as trustworthy in the consumer and lower-end commercial areas.

Other options for an ISP at your address are T-Mobile Home Internet, which advertises itself as being contractless and costing only \$50 total per month. They also do not charge an equipment fee. Their speeds are, however, variable, ranging from 33-182 Mbps download, and occasionally relying on their 4G LTE cell network to reach their destination. AT&T Internet is also available in your area. Like Xfinity, they offer a variety of speeds at several different prices, as low as \$55 per month. Like T-Mobile, they also charge no equipment fee. They do charge an installation fee of up to \$99 though, and place data caps on all but their most expensive plans.

At our price range, all the plans we're considering offer unlimited data usage for our tablets. Truthfully, T-Mobile cannot match the speeds or coverage promises of either AT&T or Xfinity, so let's not consider it further. Both Xfinity and AT&T offer a very respectable Gbps download speed for roughly the same price, \$79.99 per month and \$80 respectively. Xfinity would lock your company into a contract, and does charge fees for use of their equipment, but AT&T installation can be an expensive upfront cost. At this price AT&T would connect using a fiberoptic connection, while Xfinity would use cable. Fiberoptics are ultimately preferable, but it is extremely likely your office location is already wired for cable. AT&T speeds are negligibly slower, so the real deciding factor here should be upload speeds. AT&T does not guarantee a specific upload speed, while the comparable Xfinity plan promises 35 Mbps upload. Since will be sharing data with our consumers, and potentially investing in Cloud storage solutions down the line, that upload speed is important. The additional monthly cost of the equipment can also be offset by choosing to invest upfront in your own network equipment, which I strongly advise. Thus, I recommend committing to the Xfinity \$79.99 per month plan with 1.2Gbps download, more than sufficient for your needs.

Security/Privacy

Antivirus software is a crucial security investment for budding small businesses and will save costs in the future in data loss or theft prevented, and efficient use of our available hardware. At the enterprise level, many of these programs offer similar features. Norton Small Business is one such reputable business solution. It is compatible with Windows and Macintosh systems as well as servers, ensuring maximum coverage of our devices. Similarly, McAfee Endpoint Protection offers multiple layers of defense, and is top-of-the-line in responding to new threats. In terms of free services, Avast and AVG are both popular, and do offer paid business plans that are more feature rich. Conceivably, you could begin on one of those options and upgrade to their paid varieties as the need arises, but I do not recommend this. Security of customer data is, as stated, one of the primary IT considerations for your business. Half-measures will not do. With that in mind, Norton's business plan costs \$69.99 for the first year, while McAfee's is \$89.99. Both offer credit monitoring and some amount of insurance against lost funds. McAfee's insurance is more robust, and it does seem to update more frequently, but Norton offers protection for twice as many devices, allowing us to cover all your company assets, including some devices brought by staff from home. All these devices could also be connected to the company VPN. For this reason, I recommend you buy Norton 360 with Lifelock and re-evaluate near the end of this initial year. This will also cover our tablets. Our PoS devices running their own operating systems should not need further commercial protection, provided we keep the models and their software up to date. Square is well-trusted in this sector and additional software may not be available in their case regardless.

It is also important that all employees, and the company itself, set up and abide by a data privacy policy. This can protect your customers furthering their trust in you but is equally important in securing the company's legal rights and preventing misuse among employees. Misuse or improper security by employees can cause even more troubles should those employees leave the company and take your information with them. Several laws are also on the books that require documented compliance for data

collection from clients or employees. For your company, considering the following templated example:

<https://www.twc.texas.gov/news/eft/internetpolicy.html>

As previously stated, the conditions about “Making unauthorized copies of Company files or other Company data” are of vital import. Scion company data should only be stored on authorized and authenticated company devices, and should not be replicated beyond the premises, even on devices employees bring from home, unless those devices have been designated for work use only and properly secured. Another key phrasing is the condition that “Accessing networks, servers, drives, folders, or files to which the employee has not been granted access or authorization from someone with the right to make such a grant.” This will prevent lower-level employees, perhaps even temporary hires, from gaining undue access to files unnecessary for their work function, and above their clearance with regards to company and client transactions. There is no need for your field workers to have access to the complete financial records of the company, nor for them to be privy to the financial details of any client, or even vital payroll information. These measures should guide employees toward legal compliance and appropriate use of Scion resources. I encourage consulting with a legal team to set up terms that adequately cover you.