

### **Acknowledgement**

I'd like to thank my supervisor and general manager, Doug Carr, for allowing me the opportunity to pursue my degree. Without his support, and the support of my colleges, it would have been extremely difficult, if not impossible to have an extremely demanding full-time job while taking a full course load at school. Secondly, I'd like to thank Tom Bodnovitch for his guidance and support throughout this process. He is truly an asset to the CSIS department and the university as a whole. Finally, I'd like to thank my wife, Lisa, for her endless support. Between work and school, it's rare that we get to spend much time together, but she's right there always- pushing me and helping me to succeed in both arenas.

### **Introduction**

My academic career has been both tumultuous and lengthily. My first year of college was at Ohio State but I found it extremely difficult to get the attention and the focus needed when you are in a class of 200 students. At the end of the year, I decided to come home and start at YSU to get a more personal college experience. Shortly thereafter, I got the job at cboss, which officially started my IT career. Since then, I've juggled between work, school, and of course family. It wasn't until recently though that I decided to have a full-time school schedule. Being so close to graduation, and starting a new family, I realized that it's all but necessary to take as many classes as possible. Cboss has been instrumental in allowing me to continue school, especially since I play a key role in the company's operation.

I have worked for cboss Internet for six years. I started out as a Tech Support Rep, answering the phones and helping customers with various issues including email,

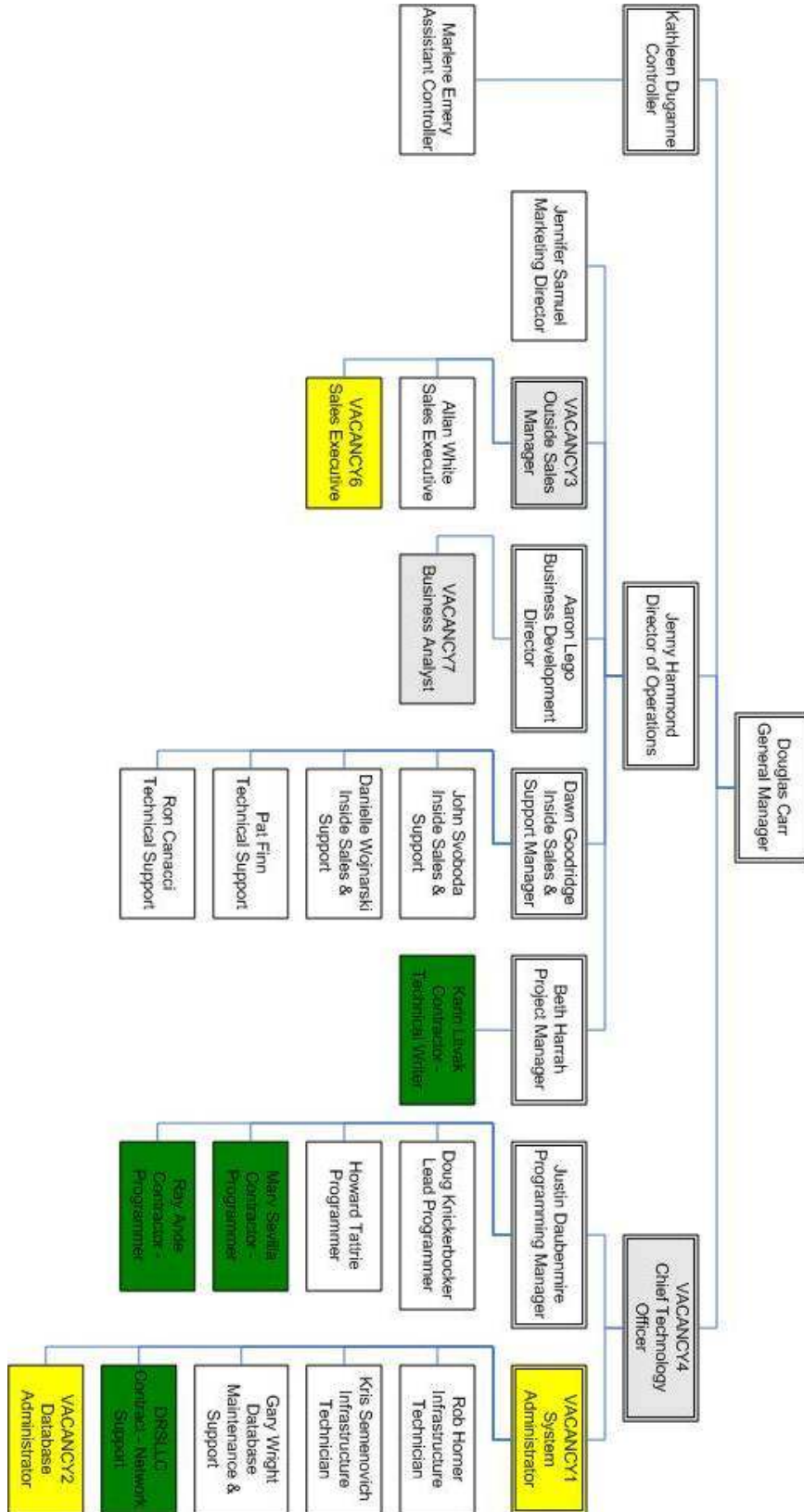
web, and billing support. It wasn't a glamorous job, but it was a great introduction to the IT industry. Within a few months of being hired, I started to take on more responsibilities as I started the journey up the corporate ladder. Currently, my position is Network Engineer and I'm responsible for the company's network infrastructure.

### **Company Description**

Cboss is a privately-held company with approximately 30 members on staff. Cboss started out as a dial-up ISP after acquiring NeoNet, one of the first local ISP's in this area. In its prime, cboss was the primary ISP for about 10,000 customers in Mahoning and Trumbull counties. However, with the internet connection trend moving towards high-speed access, focus was shifted to creating web applications and web hosting.

The majority of our business caters to web applications for government agencies such as the office of the Ohio Attorney General, the Ohio Bureau of Motor Vehicles, the city of San Francisco, and Waukesha County, Wisconsin. These applications have been designed from the ground up by our own programming and design staff to focus on the client's individual needs. We also host about 2000 web sites, ranging from a simple family website to Payment Card Industry Compliant sites that process millions of transactions every month. Finally, we still provide internet access to about 600 Youngstown residents. With such a diverse client base, cboss has made a name for itself in many circles.

### Organizational Chart



### **Position Description**

For the last two years, I have held the position of Network Engineer. My primary role is to maintain network health, performance, and security. Some of my tasks include managing backup policies and procedures, anti-virus measures, Group Policy, and Microsoft Exchange. Other tasks include research of new technology, feasibility studies, and license administration.

My direct supervisor is the General Manager. We usually meet on a daily basis to go over the current state of the network. We talk about any pending issues, future plans, and the updated priority list.

As Network Engineer, I also manage the Technical Support staff as well as the IT interns. I create their work schedules, assign tasks, and provide additional support in the event they are faced with a customer issue that extends beyond their support capabilities.

My day to day tasks are always changing. For the most part, the systems I manage, such as the backup software and anti-virus system have gotten to the point where they are on auto-pilot. They run as they are supposed to with very little interaction from me, unless there is a failure. So, one day I could be ordering new equipment and setting up servers, and the next day I could be testing a new management system. Some days are wrought with disaster when a major system fails and an 8 hour day turns into a 16 hour nightmare. Other days are as calm as could be with everything working as it should.

### **Discussion**

I really like what I do for a living. At first, I thought I wanted to be a programmer, but I quickly realized that programming, or software in general, is not how I

want to fill an 8 hour day. I like the constant change of maintaining hardware and networks. It's challenging and even a little exciting at times.

With the industry ever changing, it's great to be at the forefront of emerging technology. I love putting a new system in place that saves me countless hours of work. I also love implementing a solution to a problem that was a black cloud on an otherwise bright day. I think for the most part, my job is very similar to that of a medical professional. While they save lives everyday, I save corporate data. We both continuously learn our trade by hands on action, trying out new ideas and products to ensure the health and performance of our patients. When duty calls, we put in countless hours to rid our patients of viruses, or fix a catastrophic failure, sometimes replacing vital components with brand new ones without skipping a beat. The greatest loss for both professions is death, weather it is that of a post office worker or a Microsoft Exchange server.

Recently, my primary project has been to deploy a PCI Compliant environment for our high-availability clients. PCI Compliancy is the standard set in place by the Payment Card Industry, such as Visa and MasterCard, to ensure safe and secure web-based transactions. Compliancy dictates the security of both the network and physical layouts. This was a challenge initially because we were worried that our facility would be considered not secure enough. We finally decided to host the environment at a second facility which became our co-location. That facility has 24 hour video surveillance, biometric security, electronic key access, as well as a lockable cage in which our servers (and the locked enclosed rack that they sit in) reside. The equipment needed was also defined as requiring a multi-firewall network with triple redundancy in some cases. We

decided to use 10 servers for our environment- two clustered database servers, two clustered application servers, three clustered web servers, an intrusion detection server, a server responsible for monitoring the environment as a whole, and a server responsible for running support services like central antivirus. We also have to support the environment by using procedures like logging all environment changes or upgrades, auditing access, and running routine vulnerability scans.

I was directly responsible for setting up the servers, cabling, and power distribution, as well as deploying and maintaining the backup and antivirus systems. We decided to use HP Proliant DL 300 series servers, both in 1U and 2U configurations. Our network equipment is all Cisco branded. For power, cooling, and housing, we went with APC. The backup software we chose was IronMountain LiveVault, and the anti-virus software we chose was ESET NOD 32.

We've been an HP shop for the last few years, so HP was our natural choice for the servers. They offer unparalleled support with their 4-hour guaranteed 24/7 hardware replacement, which is critical for such a high-availability environment. All of their servers come with Integrated Lights Out (ILO) which enables remote server access even in the event that the server is powered off. Plus, the servers feature amenities such as front panel KVM access, a tool-less rack rail system, and SmartStart server deployment software that automatically installs all required drivers as well as the OS without any user input required during the install.

The LiveVault backup software is a web-based utility. The software is managed by a secure website which is perfect for managing a co-location. It's a synthetic full backup, which means that there is a primary full backup and then an incremental backup

every 15 minutes which backs up only the files that have changed since the last 15 min. At the end of every day, the incremental backups combine with the full backup to create a new full backup. The backups are kept for a 30-day retention cycle. With this policy in place, the window of loss is only 15 minutes, which means in the event of a disaster recovery scenario, we can restore all data up to the previous 15 minutes. The backups are stored locally on a Network Attached Storage (NAS) device, and then they're uploaded every 24 hours to multiple LiveVault servers across the country.

The anti-virus software used in this environment is ESET's NOD 32. With anti-virus, anti-spyware, and even a software firewall, NOD 32 is a complete security suite which can be managed and administered by a central console. We've tried various anti-virus software applications in the past, such as Symantec and McAfee, but NOD 32 is the most effective while still providing far less impact in performance compared to the other selections. Symantec and McAfee were terribly bloated and they didn't do much in terms of preventing malicious software, rather they would just report that the system was infected. Also, we've found that the big names in anti-virus are also huge targets. Some viruses have been known to disable key components in Symantec and McAfee preventing updates and even removals. Since we've had NOD 32 in place, 87 separate attacks have been thwarted.

Currently, we're in the process of planning the transition of moving the live sites to the PCI environment. This is a delicate task because we need to keep the live sites up as long as possible to provide the clients with little to no impact or loss of service during the move. The first step in that process is to mirror the databases so that both environments contain the same data. Once that's complete, we can start testing against

live data. After testing is complete, we will make the necessary DNS changes to point traffic to the PCI servers. We expect the whole process to take approximately three weeks.

### **Conclusion**

Since I started at cboss, I've learned a great deal about the IT industry. Traditionally, college is meant to prepare you for your career, but in my case, my career as prepared me for college! Actually, I don't know how I would have survived Cisco 1 this semester without my work experience. I'm very grateful for this job, and I am very confident that my work experience coupled with my bachelor's degree will open many doors for my career in the IT industry.

### **Future Learning**

I think learning is a constant process. In my immediate future, I plan on finishing my few remaining classes and then graduating in December of 2008. After graduation, I hope to either get a higher position in cboss, or find a new opportunity at another company, possibly in a different city or state. Throughout this process, I'll be constantly learning about the industry. Eventually, I plan on furthering my education even more by getting my masters degree.

### **Recommendations**

As a non-traditional student with a job already in the industry, my recommendations may not hold much weight with other students, but I'll try. If I took a full-time course load in college from my very first semester, I would have graduated six years ago. At the time, I wasn't in any rush to "grow up" but I realize now that it's much easier to loose time then it is to gain some of it back. By working full time and going to

school full time, I end up having practically no time for my friends and family. Plus, if I would have graduated six years ago, I probably would be making triple my current salary by now. So, it may seem like a ton of work, and you may miss out on a few amazing parties, but graduating college is the gateway to the rest of your life. Why put that off any longer?

## Appendices

### A: Work Schedule

My work schedule is very chaotic. I usually arrive at work at 7:00am and leave work anytime between 4:00pm and 6:00pm, while leaving throughout the day to go to class. When this semester is over, my normal work schedule will kick in, which is from 9:00am to 5:00p.

### B: Resume

# KRISTOPHER SEMENOVICH

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#### OBJECTIVE

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To assist the Director of Information Technology in establishing and maintaining the strategic long term goals, policies, and procedures for an information technology department.

#### EXPERIENCE

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- | <b>2001 – present</b>   | <b>cboss Internet</b> | <b>Boardman, OH</b> |
|---|-----------------------|---------------------|
| <b><i>Network Engineer</i></b>  |                       |                     |
| <ul style="list-style-type: none"> <li>■ Maintain and upgrade network infrastructure including the following operations:           <ul style="list-style-type: none"> <li>■ Installing hardware, establishing and verifying connectivity to existing network, conforming to established guidelines cable routing, ensuring proper lan-wan connectivity through specific VLANs and network switching appliances.</li> <li>■ Establishing power and equipment management requirements for Disaster Recovery scenarios.</li> <li>■ Assist in build out and network expansion by reviewing technical drawings as they are given to me for implementation.</li> <li>■ Installing proper operating systems according to "best practices" issued by IT director.</li> </ul> </li> <li>■ Configure DNS and IIS for website on Windows 2000, Windows 2000 Advanced Server, and Windows Server 2003 Web, Standard, and Enterprise editions.</li> <li>■ Manage Microsoft Active Directory and Group Policy.</li> <li>■ Manage Microsoft Exchange 2003 corporate email system in addition to client-side</li> </ul> |                       |                     |

Vircom ModusMail email system.

- Administer enterprise-level disaster recovery backup system (CommVault) for a network that encompasses 60+ servers, multiple-tape libraries, and SAN via fiber optic connection.
- Provide high-level client support and troubleshooting for managed and unmanaged email, internet connection issues across LAN, WAN, VPN, and Wireless point-to-point connections, in addition to website related issues.
- Manage Windows servers in a clustered and virtual environment running Windows NT Server, Windows 2000 Server, Windows 2000 Advanced Server, Windows Server 2003 Standard and Enterprise.
- Conduct training seminars for employees and clients alike on new technology.
- On-call 24/7 for network emergencies.
- Microsoft Certified OEM System Builder

**2004 - present                      1<sup>st</sup> Metropolitan Mortgage                      Boardman, OH**

***Network Infrastructure Consultant***

- Designed and implemented office network system.
- Provide support for office systems such as workstations, routers, and output devices.
- Deploy new systems as they arrive and integrate them in to the existing network.

**1997 - 2001                      Circuit City, Inc.                      Boardman, OH**

***Computer Sales Counselor***

- Developed, solicited and processed new accounts.
- Identified, researched and resolved technical problems responding to customer inquiries for initial technical support on new products.

Position required voluminous knowledge of latest information technology hardware and major software applications.

**1998 - 2000                      John J. Bartolo, PE/PS, Inc Boardman, OH**

***Business Systems Analyst***

- Reviewed, analyzed and evaluated business systems and user needs.
- Implemented software training course for new recruits — speeding profitability.
- Provided support to employees, tracking and monitoring computer problems to insure timely resolution.
- Relied on experience and judgment to accomplish goals of engineering firm.

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**EDUCATION**

**2001 – present                      Youngstown State University                      Youngstown, OH**

- Bachelor of Science in Applied Science in Information Technology.
- Senior status.
- Two semesters remaining.

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**COMMUNITY ACTIVITIES**

Member of Sigma Alpha Epsilon fraternity.

**C: Employer Evaluation**

December 3, 2007

RE: Kris Semenovich Internship

Prof. Bodnovitch:

The purpose of this letter is to give my personal recommendation to Kris Semenovich for his outstanding performance and leadership during a critical project.

Recently, CBOSS became PCI Certified by Visa, a highly sought-after certification in the web payment processing industry. This certification ensures web site security and reliability for safely processing your credit card transactions.

Kris played a vital role in this project. He was directly responsible for implementing a backup solution and designing a backup policy that would satisfy PCI standards while operating within the budget. He was also responsible for setting up the physical infrastructure at our datacenter location, including multiple switches, firewalls and routers. Finally, we relied on his proven experience in anti-virus management to keep our environment safe and secure.

What I like most about Kris is his ability to focus, even during a critical situation. His insight about IT systems is unparalleled to that of other prospective graduates that I've worked with in the past. For that, I believe that he will be undoubtedly successful.

Kris is a great asset to our team, and without him, this project may have ended differently. It is with great pleasure that I recommend Kris for any future endeavor that he may pursue in this industry.

Sincerely,

Doug Carr  
General Manager  
CBOSS, Inc.

December 3<sup>rd</sup>, 2007

Re: Kris Semenovich Internship

Dear Professor Tom Bodnovitch,

This letter serves as a recommendation for the excellent performance that Kris Semenovich has given to CBOSS during our effort to become PCI Certified by Visa.

The project included implementing a new network at an offsite location. The nature of our new network is that of high-level data security which protects our client's payment and personal information. This has been CBOSS' major project for over a year, and required dependable and knowledgeable resources be involved from start to finish.

Kris has demonstrated a high sense of dedication, integrity, and accountability while acting as our knowledge expert for our Live System Backup Procedures, Disaster Recovery Planning, Anti-Virus Security protection and while installing new network infrastructures as needed during the course of this project.

Kris has performed a wide variety of network related tasks for this project, while holding himself responsible and accountable for our company's internal Anti-Virus protection, Live System Backup implementations, Server system upgrades and maintenance, and general tech support during the lifecycle of this project.

Kris' technical skills were clearly demonstrated by his management of our backup servers, hardware and software implementation, and general network administration. But I was most impressed with his ability to apply his knowledge in this field to research, evaluate, recommend and implement two great products that we now depend on as part of the backbone of our new network.

It is a personal pleasure to recommend Kris, and I know he will be a valuable professional asset to any organization.

Sincerely,



Beth Harrah  
Project Manager  
CBOSS Inc.