Moving office and mitigating IT risk

Executive Summary

Some considerations for a business moving offices, wanting to minimise disruption by mitigating IT risk.

Graham Lewis
Director of IP Engineering
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Introduction

In June 2012 Spitfire moved office from our old premises at South Bank Business Centre (now demolished to be the new American Embassy) to a renovated Victorian era former Printworks building. We employed a team of consultants and contractors to fit out the new building and work began to plan the move. What we were told constantly was the biggest single risk to the move was the IT infrastructure.

IT is critical to our business and as deadlines on the new building loomed it became apparent that we were going to have a single weekend to move all of our IT infrastructure to the new building and be up and running by Monday morning.
Spitfire have helped many companies move office and change their IT infrastructure over the years and seen the problems caused by things that could have been avoided. We are not claiming to be experts in Project Management but we have learned a thing or two over the years so would like to share how we mitigated IT risk when we made our move.

Change as little as possible

Our general approach to any IT work is to change as little as possible and if something has to be changed then only change one thing at a time. This was going to be difficult with a big bang move from one office to another but this remained a guiding principle.

Clear the decks

We had already planned to make major changes to our internal Windows network in 2012, replace some old hardware and migrate to Exchange 2007 and Active Directory 2008. We had already postponed this work from the previous year because we knew it was time consuming and risky. We knew we had to make these critical changes before we moved and set a deadline of completing all the Windows and Exchange server migration work before April 2012.

We hired a new member of staff with experience of such migrations to beef up the internal IT team and pre-staged the migration architecture and practiced all the steps involved. Over several weekends in the first months of the New Year we moved to the new Windows network and allowed ourselves time for all this to bed down and iron out issues that inevitably arise.

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We needed all the software upgrade work to be out of the way by the time we moved so that if we did have problems in the new building we knew that it was not going to be because of software issues. We placed an embargo on OS and application software updates 4 weeks prior to the move. We didn't want to take anything with us to the new building that we had not tried and tested beforehand.

Consolidate and de-clutter

"Turning servers off, allowing them to cool and then shaking them about in a removal lorry will lead to hardware failure."

We had a sprawl of odd servers of different makes and vintages that did very specific tasks and our old comms room looked at times more like a second hand computer fair. We still needed the functionality of these but the hardware was getting old and we feared that some of them would not survive the move. Servers are rarely turned off and spend their entire life powered up and running which is good for computer hardware as all the components reach stable temperatures and operating currents. Often turning servers off, allowing them to cool and then shaking them about in a removal lorry will lead to hardware failure.

In total we consolidated 12 old servers onto two new virtual servers using VMware. One at a time the server operating system and application was moved and the old servers retired. The great advantage of virtualising existing servers is that you don't have to disturb the application or the environment it works in. By virtualising the servers we reduced the number of servers we would have to move and the complexity of the network. We reduced our physical server count from 28 servers to 16 meaning we had less to move and a more standard hardware base which made assembling spares and standby hardware easier.

LAN architecture

Our old office was a small two floor unit. All desktops were CAT5 cabled into our comms room and we had a flat switched Ethernet network for voice and another for data consisting of stacked switches.

In the new building the comms floor would be on the ground floor and the CAT5 sockets on the 4th floor, added to the fact that the building was split into three separate wings made a flat switched solution impossible.

The obvious solution was a classic “collapsed backbone” architecture with stacks of switches in each wing linked by fibre optic cable to the comms room.

In addition we wanted to converge voice and data on the same switches and replace our separate voice switches. This is all text book design for a Greenfield site. However we would be moving an existing operation into the new building over a weekend which is NOT the same as a Greenfield site slowly adding new users.

To be sure that on the weekend of the move we were changing as little as possible we purchased all the new switches and set them up in our existing comms room exactly as they were going to be in the new building with lengths of fibre between the switch stacks. Over the course of two weeks we slowly migrated our live network to the new topology in the existing building. We ironed out issues with VLAN trunking between telephone handsets and DHCP scopes – in themselves minor issues but we had given ourselves the time to sort them out prior to the move. Certainly had we discovered those issues for the first time on the move weekend things would have turned out very differently.

By creating the new switched architecture in the old comms room we knew that on the day of the move we would be transporting everything as is – no thinking required. The ONLY things that would change would be that in the new building the switch stacks were spread out over the building and the small lengths of fibre would be much longer lengths of fibre installed by the cabling contractors.

We purchased additional spare switches and when the cabling was done in the new building installed a barebones network layout to verify that all the fibre links did work and that we had purchased the correct fibre interface cards – a common mistake as fibre comes in different types and with different types of connector. We tested the new cabling end to end, and had ADSL lines put into the building for sub-contractors to use so we knew we would have very basic Internet connectivity if all else failed.

WAN woes

We had ordered a number of 1Gbps fibre circuits for the new building at the start of the year and we feared we would be paying rental on expensive circuits sitting doing nothing but our experience of working with circuit providers over the years is that things can and will go wrong. In the event due to problems with blocked ducts and embargoes on street works caused by the Olympics some fibre circuits were not completed until November 2012.

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In the end we had our primary link to our Docklands data centre installed about a month before the move albeit in a temporary location in the basement of the building. We tested and tested the circuit and left it on 24/7 hour monitoring whilst our new comms room was being built. We could at least be certain that we had connectivity ready prior to the move and we are glad we ordered those circuits in plenty of time.

Backups

Every night, we take backups of all our servers onto tape and onto a storage network in our Docklands data centre. If there was one night in our entire Company history where we absolutely had to be sure we had good backups then it was the Friday night prior to our move.

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The backups dictated the precise timing of the move, our critical path in Project Management terms, so we identified and managed it.

A full backup typically took 14 hours, if it failed midway and had to be re-started even longer. We worked in the weeks prior to the move to reduce the backup time by archiving material and splitting backup jobs.

So whilst we could start moving furniture and desktop IT late on Friday afternoon it was made clear that nothing in the comms room was to be touched until we knew we had a complete set of clean full backup tapes. This dictated that we could not start the IT move until Saturday morning at the earliest, reducing the time available to do the work and potentially eating away at our troubleshooting and snagging time.

There was pressure to start to part dismantle the comms room but this was ruled out and not a single cable was touched until we had verified backups. We knew that it was very easy for someone to accidently pull out the wrong cable and disrupt the backup which would push everything back even further.

"Known unknowns" and "unknown unknowns"

Donald Rumsfeld said there are "known unknowns" and "unknown unknowns". Our "known unknowns" were that a hardware failure (most likely a disk drive) would occur in transit so we had spares on standby (not in the removal trucks). The "unknown unknowns" you can only plan for by giving yourself time and resources so that when they arise they can be dealt with. Skilled experienced people are the best resource to have around when "unknown unknowns" become known.

Prepare for disaster

We revised our disaster recovery plan and tested it over and over. We got people who had never seen the plan before to try it out and learned how to write clearer instructions.

We created a virtual server and network solely for the purpose of testing and refining the disaster recovery procedures for every server. We were confident that if on the day of the move we had a server failure we knew how to recover the server.

We anticipated a hardware failure rate upon arrival of 10% and ensured that we had replacement hardware such as disks and entire servers already in the new comms room ready to go if needed and complete backups.

Less is More

There is a huge temptation to throw people at the move, the more the merrier etc. Experienced IT managers know that this is often counterproductive as more people means more opportunities for miscommunication and well meaning people just getting in the way requiring work to be undone and redone the proper way.

The physical shift was being done by a removal company our own IT people were responsible for carefully removing servers and switches at the old building and installing them at the new building.

A core IT team was selected for the move, the ones with the right skills and attitude. You need people who can follow a plan are logical unflappable and indefatigable. It helps if they have a good sense of humour as well. Luckily because of the business we are in Spitfire has those kind of people.

We had regular meetings leading up to the move so that everyone discussed the issues and everyone knew what the plan was – it wasn't just a piece of paper with timelines on it. We tried to tease out the unknowns as best we could. Everyone knew what they would be doing on the day of the move even if their illustrious IT manager was run over by a bus. All the IT guys enjoyed the process because everyone was involved and saw what everyone else was going to be doing, shared knowledge and ideas and worked within the constraints we had.

We laid out what the business critical services were and targets as to what we wanted working by when. We planned that as a minimum we wouldn't be going home Saturday night without working telephone calls in and out, Internet connectivity and email to the desktop. We run some critical billing and network operation services that had to have downtime restricted to an absolute minimum. By the Sunday we needed our internal CRM and accounting packages live. We wanted everyone to be able to come in on Monday sit down at their new desk and carry on working.

The day arrives

On the day of the move, a valiant team member woke throughout the night to check on the progress of the backups and they had all ran successfully by 9am. We got everything over to the new building by Saturday lunchtime. Two engineers started installing the switches, routers and firewalls and getting end to end connectivity working. Two others started racking servers. Another team installed the desktop PCs and telephones.

As in most environments the servers have to be started in a certain order – you need DHCP, DNS and Active Directory services before anything will boot and applications need SQL and fileservers to be present before they would work.

As it happened we had one disk drive fail on start-up which got replaced and one power supply went bang as it was powered on but this was on a dual power supply machine.

By 6pm on the Saturday we had all the essential services working. We continued with minor issues till 8pm and everyone got sent home. At this stage we knew the basic business would be up and running on Monday and we wanted to avoid any heroic overnight work which are going to leave staff mentally exhausted and prone to making mistakes. Two of the server guys came back in at a leisurely time on Sunday morning to continue bringing some less critical systems back up. System testing continued and everything was working as it should.

The work on the new building was done to a tight deadline and so we weren't able to show the majority of our staff the new building until we opened it on the Monday morning. It is a credit to everyone involved that after a short acclimatisation period and everyone admiring the stunning views we have over South London everyone quickly settled into work. We were back in business and only the postman knew that we had moved.

In summary

We ensured that all LAN infrastructure changes needed were made prior to the move so that we were just re-locating existing equipment rather than getting to grips with a new architecture. We ensured all software changes were done and bedded in well before the move and placed an embargo on further changes.

A small team with skills and experience was put together that practiced and rehearsed for any eventualities that we could think of and out of this we assembled documentation, hardware and software we might need if things went wrong during the move. We had the courage to place limitations on what could and could not be done to protect the IT. We tested what was possible and made contingency for what was not possible.

About the author

Graham Lewis MSc MIET MBCS is Director of IP Engineering at Spitfire Network Services Ltd a leading UK ITSP.

He is responsible for the technical implementation and management of Spitfire's SIP trunking service. He is a member of the British Computer Society and the Institution of Engineering and Technology.

Spitfire Network Services Limited
The Printworks, 139 Clapham Road, London, SW9 0HP