

# VDI Solution for Kiwiplan Support Staff

By

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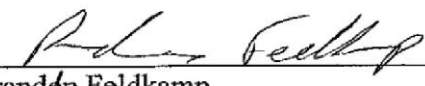
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## **Abstract**

Kiwiplan Software creates software for corrugated paper plants all over the world which they have to support. The support staff must VPN into their client's network to begin troubleshooting their software. For every client, Kiwiplan's support staff must utilize a unique set of instructions to configure the VPN. The support staff constantly connects to different client networks making it difficult to memorize the instructions for individual clients. This results in scenarios where a support agent may spend an hour connecting to a client just to solve a 5 minute issue. Kiwiplan also had a secondary issue in regard to security due to the old process the support staff used to connect to VPN's. In order to solve these issues a cluster of preconfigured virtual machines already connected to the client networks were created. The Kiwiplan staff then could remote in using Active Directory credentials for easy access and increased security.

## **Introduction**

For our project we reached out to Kiwiplan, a software company that develops software for the corrugated paper and packaging industry. Kiwiplan started out as small software company in 1981 in Auckland, New Zealand and is now a part of the Fortune 500 Company Illinois Tool Works. After meeting with the System Administrator of the head office, John Davidson, we discovered that they had a problem that we could solve and they were comfortable allowing us to complete.

## **Problem Need**

Kiwiplan's support staff service over three-hundred customers. In order to service these customers the support staff generally needs to connect to the client's network through a Virtual Private Network or VPN. As Kiwiplan's business has grown, so too have the service requests. The Cincinnati office alone gets over 250 calls or tickets a week. To help compensate for the increase in service requests Kiwiplan has hired more support staff, but they still face an issue of inefficiency. Currently, when a support agent begins working on a ticket he usually starts by connecting a VPN client to the client's network. If the support agent does not work with the client often they may have to find instructions on how to connect to the client network's VPN and then download the VPN client. Several of the VPN connections have pre-requisites such as a scan to make sure the user has anti-virus software installed. This can result in extra work for the support agent as he may have to delete the anti-virus software he had installed and download the anti-virus software that the VPN client requires.

Kiwiplan's support staff often had a secondary issue when they are traveling or working from outside the office. The VPN clients don't always play nicely when they attempt to connect to their customers VPN's while having a VPN connection into Kiwiplan's network. Support agents have reported that connecting to some clients will knock them off of Kiwiplan's network meaning they cannot access Kiwiplan's resources while they are traveling or working from home.

A tertiary issue faced by Kiwiplan was a lack of control and security over their support staff's VPN's. In order to make their lives easier many of the more technologically advanced users created their own virtual machines to manage their VPN's. The system administrator had no control or ability to audit these private virtual machines creating an increased security risk.

## **Solution**

In order to solve Kiwiplan's problem, we created a cluster of preconfigured virtual machines that Kiwiplan's support staff will be able to access from anywhere around the globe. In order to do this we configured VMware ESXi on a physical server. Next we created virtual machines that will have pre-configured VPN clients to all of their customer's networks. They were set up and organized in a manner so that they do not conflict with each other and are easily accessible for the support staff. This VDI implementation prevents many hassles that the support staff deal with on a daily basis. The management of the virtual machines will be in the hands of the system administrator and all changes will be controlled through him. "Another advantage is that systems management is centralized. When it comes time to patch an operating system or update an application, IT only has to do it on the master, or golden, disk image and all users receive the upgrades -- no more pushing a single update to multiple desktops across the enterprise." (1) This eliminates more of the common issues that the support staff came across, s

well as moving to a VDI solution; this will help to eliminate cost of ownership. “DC Research reports that Horizon View customers have been able to lower TCO for their desktop infrastructure by 50 percent, saving more than \$500 annually per user.” (6) This will eliminate multiple machines for multitasking and to just use specific VPN clients. We also applied Active Directory credentials as a requirement to access the virtual machines for increased security

## **User Profiles**

**Application:** VMware Horizon View/ VMware Player

**Potential Users:** Targeted users are Kiwiplan Support Technicians and Kiwiplan Developers. Additional users may arise such as sales, accounting and general office staff if project is expanded.

**Software and Interface Experience:** Most users have a moderate to high level of experience with remote desktop software as well as virtualization software.

**Experience with Similar Applications:** Most of the core users have experience with some sort of remote desktop software such as Microsoft Remote Desktop.

**Task Experience:** The task of connecting to a VDI to connect to the client networks will be new to Kiwiplan staff. However our aim is to make it as easy as possible so that prior experience will not be necessary.

**Frequency of Use:** Virtual Desktop Interfaces will be used daily.

### **Key Interface Design Requirements that the Profile Suggests:**

Quick access to the VDI that reduces connection time to Kiwiplan's client networks is a must.

The connection to the VDI needs to be simple and seamless so that users prefer it over setting up their own VPN.

There needs to be easy to follow tutorials to ensure all users feel that connecting to the VDI is not extra work and doesn't add frustration.

**Application:** VMware Horizon View, VMware ESXi, VSphere

**Potential Users:** Targeted user is Kiwiplan's System Administrator who will maintain the virtual server once the project is completed.

**Software and Interface Experience:** User has some experience with VMware products but does not have production ESXi servers.

**Experience with Similar Applications:** User is very experienced at managing servers, however managing a server with a cluster of VM's will be new to him.

**Task Experience:** User has a very high level of experience managing a network infrastructure.

**Frequency of Use:** Weekly to maintain virtual machines.

# Technical Elements

## Hardware

Description	Quantity
PowerEdge R620, Intel Xeon E-26XX v2 Processors (210-ABVQ)	1
PowerEdge R620 Motherboard, TPM (591-BBBQ)	1
Intel Ethernet I350 QP 1Gb Server Adapter, Low Profile (430-4442)	1
iDRAC7 Enterprise (421-5339)	1
Intel Ethernet I350 QP 1Gb Network Daughter Card (430-4447)	1
Chassis with up to 10 Hard Drives and 3 PCIe Slots (318-1433)	1
Bezel - 10 Drive Chassis (318-1432)	1
Power Saving Dell Active Power Controller (330-5116)	1
UEFI BIOS Setting (331-3765)	1
RAID 10 for H710P/H710/H310 (4-10 HDDs in pairs) (331-4228)	1
PERC H710P Integrated RAID Controller, 1GB NV Cache (342-3531)	1
Heat Sink for PowerEdge R620 (331-4762)	1
Intel Xeon E5-2660v2 2.2GHz, 25M Cache, 8.0GT/s QPI, Turbo, HT, 10C, 95W, Max Mem 1866MHz (338-BDBE)	1
DIMM Blanks for Systems with 2 Processors (317-8688)	1
Heat Sink for PowerEdge R620 (331-4762)	1
Intel Xeon E5-2660v2 2.2GHz, 25M Cache, 8.0GT/s QPI, Turbo, HT, 10C, 95W, Max Mem 1866MHz, 2nd Proc (338-BDBT)	1
16GB RDIMM, 1600MT/s, Low Volt, Dual Rank, x4 Data Width (319-1812)	8
1600 MHz RDIMMS (331-4424)	1
Advanced ECC (331-4427)	1
600GB 10K RPM SAS 6Gbps 2.5in Hot-plug Hard Drive (342-0847)	10
Dual, Hot-plug, Redundant Power Supply (1+1), 750W (331-4605)	1
Power Cord, C13 to C14, PDU Style, 12 Amps, 2 foot, Qty 1 (330-3150)	2
Internal Dual SD Module (331-4441)	1
1GB SD Card for RIPS (342-3595)	1



# Technical Elements

## Software

For this project we used VMware products. We used VMware ESXi as the server software which will be controlled by vSphere. The support staff use the VMware View Client to access the virtual machines. We chose to go with VMware Horizon View to manage the virtual machines and create pools of virtual machines. With VMware Horizon View we are able to manage all of Kiwiplan’s customers VPN clients and have them pre-configured for the end user to eliminate having to install all of the different clients on their personal computers.

List of software:

VMware vSphere with operation Management Standard Acceleration Kit- License	VMware Support and Subscription Basic- Technical Support – 1year for VM	VMware Horizon View Add on	VMware Support and Subscription basic- Technical support- 1 year
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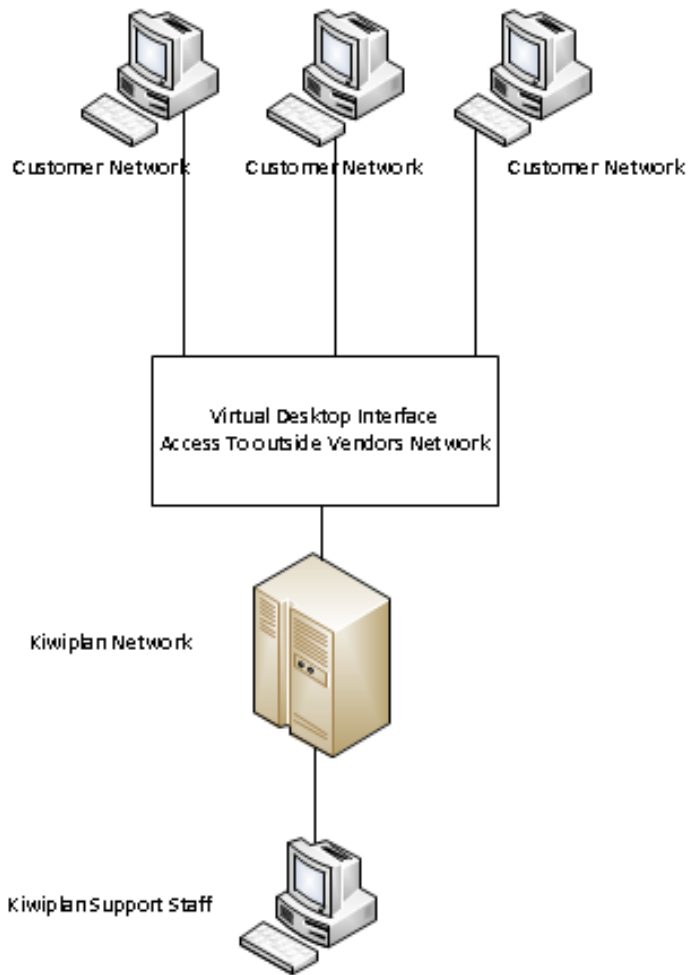
## **Budget**

Kiwiplan has allotted us a budget between \$16,000 and \$18,000. The hardware and support package for a Dell PowerEdge R620 Server costs \$11,873.23 after tax. Software costs however, exceeded our original budget. The company did see a need for this improvement, so our original budget was increased to \$30,000, allowing for the purchase of the necessary software. The software we decided to use was VMware Horizon View, which included 20 licenses for end users. The total for the VMware software plus required support licensing was \$16,874.90. We finalized the project within our new budget restrictions, spending \$28,747. Kiwiplan was able to justify increasing our budget in order for this project to be completed because this improvement will save them time and money over the course of the next few years.

## **Cost Analysis**

- Average 35 support calls per day.
- With our VDI implementation the support staff saves an estimated 5 minutes per call.
- Each hour of support costs Kiwiplan \$48.
- Saves approximately 3 hours of support staff time a day.
  - $\$48/\text{hour} \times 3 = \$144$  per day
  - $\$144/\text{day} \times 5 = \$720$  a week
  - $\$720/\text{week} \times 52 = \$37,440$  a year
- Estimated ROI is 9 months.

## Network Diagram

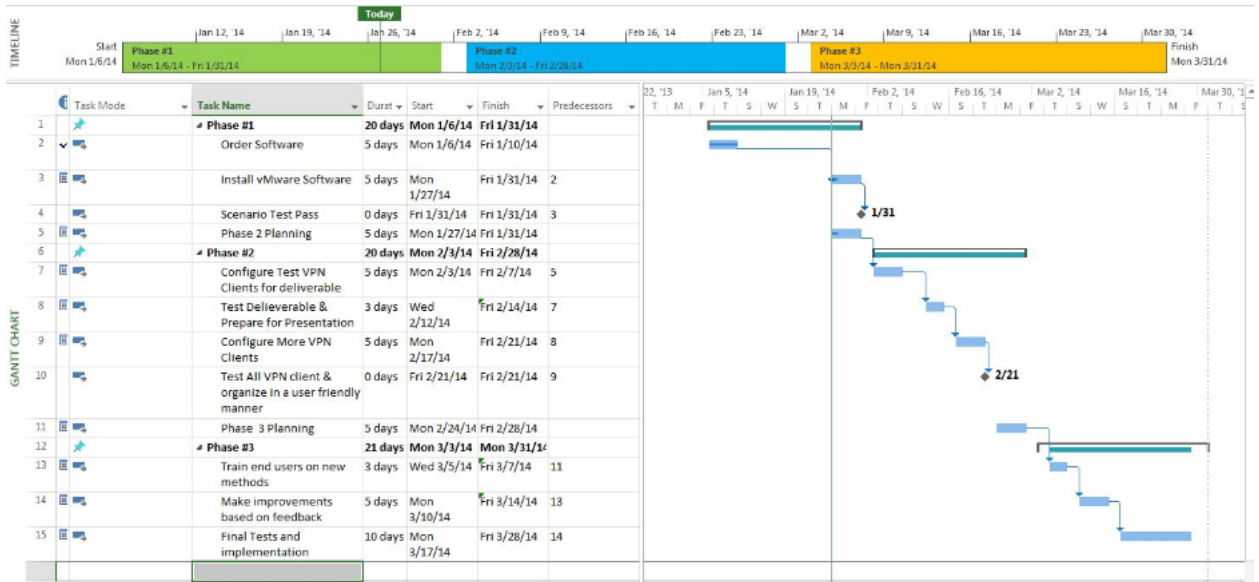
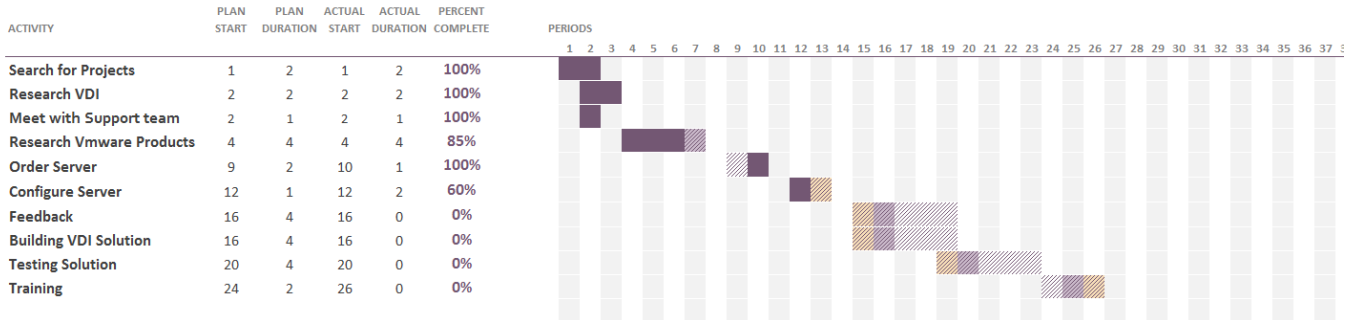


## Timeline

Below is a Gantt chart to show a timeline of the project. Every period on the chart represents a week of time. The second Gantt chart is the timeline for implementation and testing to be carried out over the final weeks of the project.

# VDI Solution

Period Highlight: 0



## Testing Plan

The testing plan shows how we tested creating virtual machine pools to make sure that it was fully functional before we went into production. Also in the testing phase we created training documents to help end users install the VMware view client to access desired virtual machine pools.

## Testing Report for VMware Horizon View Virtual machine Pools

### System Admin Roles:

1. The system administrator can create virtual machines for end users
2. The system administrator can create a pool of virtual machines for specific VPN clients
3. The system administrator can grant access to specified users for specific Virtual machine pools
4. The system administrator can delete virtual machines and pools

### Application Users Roles:

1. The application user can select assigned virtual machine pools.
2. The application user can run the VPN clients on selected virtual machines

### Testing Plan:

#### Testing the System Administrator Virtual Machine Pool Creation

1. Log into Horizon View Administrator
  - 1.a. Select Pools
  - 1.b. click add pools
  - 1.c. click manual pools
  - 1.d. select floating, click next
  - 1.e. Select full virtual machines, click next
  - 1.f. Create Pool ID and Display name, click next
  - 1.g. select pool settings
  - 1.h. select Virtual machines desired for pool
  - 1.i. click ok create pool

#### End User Connecting to A pool

- 2.a. open VMware view client
- 2.b. Login into Kiwiplan Horizon View server using usview14.kiwiplan.us using AD credentials
- 2.c. Select desired pool to log into
- 2.d. Run vpn client on opened Virtual machine

### System Administrator

#### Creating a Virtual machine pool test:

Req no:	Item #	Test case #	Input	Expected Output	Actual Output	Pass/Fail	Reasons for failure/Pass	Date
1	1a	1	(Horizontal view manager screen) Select Pools	Pools configuration window	Pools configuration window	P	Logged in properly with pools window	2/5/14
1	1b	1	Click add pools	Add pools window opens	Add pools window opens	P	Opened Pools window	2/5/14
1	1c	1	Click manual pools	Accepts manual pools input	Accepts manual pools input	P	Allows manual pools	2/5/14
1	1d	1	Select floating (pool)	Select floating (pool)	Allows for floating pool	P	Allows for a floating pool	2/5/14
1	1e	1	Select full virtual machines, click next	List of Available Virtual machines	Shows list of Virtual machine	P	Selected desired virtual machines	2/5/14
1	1f	1	Create Pool ID and Display name, click next	ID pool list comes up to create names	ID pool list comes up to create names	P	Created a pool name	2/5/14
1	1g	1	select pool settings	Pool Settings Window	Pool settings window	P	Selected desired settings	2/5/14
1	1i	1	select Virtual machines desired for pool	Select virtual machines window	Select virtual window	P	Chose Desired virtual machines to include in pool	2/5/14

End User

Logging into a pool

Req No.	Item #	Test case	Input	Expected output	Actual output	Pass/Fail	Reasons for pass/fail	Date
2	2.a	open VMware view client	Open VMware Client	Login window for VMware View window	Login window for VMware View window	P	When opening VMware view the program opened	2/8/14
2	2.b	Login into Kiwiplan Horizon View server using usview14.kiwiplan.us using AD credentials	Username/password/server name	The VMware client verifies credentials and allow access to pools	The VMware client verifies credentials and allow access to pools	P	Accepted user credentials and shows available pools based of permissions	2/8/14
2	2.c	Select desired pool to log into	Click the pool you would like to connect and hit connect	Loads the selected pool and loads virtual machine	Loads the Selected pool and loads Virtual Machine	P	Loaded the selected virtual machine	2/8/14
2	2.d	Run VPN client on opened Virtual machine	Run the VPN client for the virtual machine	The VPN client runs and connects	The VPN client runs and connects	P	The VPN client runs as plan	2/8/14

## **Conclusion**

In conclusion we successfully solved the problem for Kiwiplan Support staff and provided a solution that can be updated and modified by the system administrator by following our step by step guide. We were able to implement a new server running the VMware Horizon View Suite and complete installation of virtual machine pools with pre-configured VPN clients. This eliminated the time for support staff of Kiwiplan from having to find the correct client to install and right servers to connect to.

For the end user all that is needed to access the collection of Virtual Machine pools is the Horizon server address, and their Active Directory Credentials. Once logged in they can choose which pool based on the name of the company in which they are supporting. Once they choose the desired pool a window opens up as a desktop with that company's VPN client and info with the credentials configured.



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