

# Deployment Guide for Cisco Office-in-a-Box with VMware Horizon View

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Building Architectures to Solve Business Problems



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### About the Author



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### Contents

Introduction 6 What Problems Does Cisco Office-in-a-Box Solve? Which Organizations Benefit from Cisco Office-in-a-Box? 6 Cost Effectiveness of Cisco Office-in-a-Box 7 Cisco Office-in-a-Box: How Does It Work? 7 Where Cisco Office-in-a-Box Fits in the Deployment 8 Requirements, Solution, and Benefits 14 Basic VDI Concepts - Understanding the Terminology 15 Deploying Cisco Office-in-a-Box 15 Managing Horizon View Agent Direct-Connection on the Branch Hosted Virtual Desktop Master Image 16 Atlantis ILIO Deployment Option 18 Installing Cisco Office-in-a-Box 18 Atlantis ILIO Installation and Configuration 31 Atlantis ILIO Test Results 32 32 Iometer Login VSI 33 Summary of the Login VSI medium workload: 33 Login VSI Test Configuration 33 33 **Test Parameter Configuration Test Results** 34 Conclusion 35 For More Information 35



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#### Introduction

The modern workplace continues to evolve, and improved mobility is essential. New bring your own device (BYOD) and virtual desktop infrastructure (VDI) initiatives try to meet the need for an increasingly agile, productive, and collaborative workforce. Most VDI adopters have found that deploying VDI at the branch or remote office is a challenge. When virtual desktops are centralized so that users access them across the WAN, the user experience is poor and business continuity must rely on the WAN. Cisco Office-in-a-Box offers a way to easily collapse enterprise branch office or retail store IT services into a single box. These services include VDI where the virtual desktops are hosted locally on a Cisco Unified Computing System (Cisco UCS) E-Series server. Cisco UCS E-Series servers provide the best user experience (LAN-based connectivity) and remove reliance on the WAN for business continuity.

This guide shows how to deploy a VMware Horizon View VDI solution to a Cisco Next-Generation WAN branch office. This guide explains the benefits, how to deploy the solution that combines the Cisco Integrated Services Router Generation 2 (ISR G2) platform with Cisco UCS E-Series servers, and where to find additional information to make the deployment a success.

### What Problems Does Cisco Office-in-a-Box Solve?

For the mobile branch office or the standard branch office, bandwidth and latency requirements for VDI come at a premium cost. When you host end-user VDI virtual machines and applications on the local Cisco UCS E-Series server, all mission-critical applications run on site. When these applications run on site, we need not depend on the WAN to deliver critical services. Also, the user experience is greatly improved because access to the VDI session remains within the local office. Now with Horizon View Agent Direct-Connection branch user can access a virtual desktop directly, without a connection to the VMware Horizon View connection server. In the case of a data center to branch office deployment model, the administration of the VDI pool for the branch can be managed centrally through the VMware Horizon View Connection server, but users do not require network connectivity to the connection server to access their hosted desktops. The solution can be delivered within a single Cisco ISR G2 box, which greatly reduces the number of devices that must be at the branch office or retail store to deliver the required services. One box means that on-site management is simpler and the box can be managed remotely. Two deployment models are supported with VMware Horizon View 5.2. One model is fully distributed where the VDI management infrastructure and VDI sessions are hosted within the Cisco UCS E-Series server. The second model is central management with distributed VDI sessions where the VDI management infrastructure is centralized at the data center, but VDI sessions are distributed across branch offices hosted in Cisco UCS E-Series servers.

# Which Organizations Benefit from Cisco Office-in-a-Box?

Cisco Office-in-a-Box can help organizations that are considering VDI to centralize desktop services. These organizations want to take advantage of the many benefits that VDI offers but do not want to upgrade their WAN to support VDI sessions across their WAN, or they do not want to rely on WAN connectivity for users to access mission-critical applications.

### **Cost Effectiveness of Cisco Office-in-a-Box**

The Cisco Office-in-a-Box solution provides a way to collapse all services that businesses require into a single box, which results in easier management of services, a much smaller device footprint on site, and lower TCO. This product is part of a multiphased approach of the Cisco VDI Cloud connector strategy to address business continuity and end-user experience. The Cisco UCS E-Series servers and the Cisco ISR G2 are built for enterprise-grade performance with a service life expectancy longer than commercially available servers and routers. Also, the Cisco ISR G2 and Cisco UCS E-Series solutions are covered under one Cisco SMARTnet services contract, which provides expert technical support, flexible hardware coverage, and smart, proactive device diagnostics. Your IT staff has any-time access to Cisco engineers in the Technical Assistance Center (TAC) and an extensive range of resources, tools, and training.

### **Cisco Office-in-a-Box: How Does It Work?**



The Cisco ISR G2 platform runs Cisco IOS® Software, which delivers an array of IT services such as these services:

- network routing
- IP PBX (Cisco Unified Communications Manager Express/Survivable Remote Site Telephony [Cisco Unified SRST])
- public-switched-telephone-network (PSTN) connectivity
- WAN acceleration (Cisco Wide Area Application Services [Cisco WAAS])
- remote access
- Network Address Translation (NAT)

- Cisco IOS firewall
- DHCP

The Cisco UCS E-Series x86 server modules can be inserted into Cisco ISR G2 platforms and can deliver additional services. (See the Cisco UCS E-Series datasheet for a platform compatibility matrix.) The Cisco UCS E-Series supports VMware ESXi 5.0 and 5.1, which allows you to virtualize multiple applications and services. One such service is the VMware Branch Office Desktop Solution. The Cisco UCS E160D server module can support up to 48 GB of memory, and it runs on a 6-core Intel processor with hyperthreading support, which makes it a 12-core server. Depending on the Cisco ISR G2 platform, you can insert more Cisco UCS E-Series modules if more computing power is necessary. Additional modules can expand the virtual desktop solution or add applications such as video surveillance, digital signage, or virtualized Cisco applications like vWAAS.

The Cisco ISR G2 motherboard and the Cisco UCS E-Series blades interconnect through a backplane 1 Gigabit Ethernet switch, which allows for virtual data traffic to traverse the router services and set policies. The Cisco ISR G2 supports 2 or 3 Gigabit Ethernet ports. One of these ports can be used to connect to an Internet telephony service provider (ITSP) connection to provide Internet connectivity to the virtual desktops and access to the Internet can be managed through policies set on the router. Also, firewall services can be turned on to prevent incoming attacks from the Internet.

A second Gigabit Ethernet port on the router can be used for management. The Cisco UCS E-Series server supports the Cisco Integrated Management Controller (a BMC feature) to allow configuration, administration, and monitoring of server resources via a web-based GUI. The Cisco UCS E-Series blades have been validated by VMware for their Branch Office Desktop through the Rapid Desktop deployment program. The VMware Rapid Desktop deployment solution allows easy deployment and configuration of a VMware Horizon View Branch Office Desktop Solution and delivers the benefits and services of Cisco ISR G2 technologies within a single box. (VMware Horizon View was formerly known as VMware View.)

A third Gigabit Ethernet port on the router can be used for voice services. The Cisco ISR G2 supports Cisco Unified Communications Manager Express, which is an IP PBX application and supports Cisco IP phones or analog phones using Cisco analog voice/WAN interface card (VWIC) modules. For PSTN, access to the Cisco ISR G2 supports a variety of PSTN access VWIC modules (T1 PRI, T1 CAS, FXO, and BRI) and supports Session Initiation Protocol (SIP) trunking to SIP service providers. http://www.cisco.com/en/US/products/sw/voicesw/ps4625/index.html

Also, the Cisco ISR G2 platforms support Ethernet switch service modules that insert into a service module slot to provide network access to VDI clients and other network devices, such as IP phones. http://www.cisco.com/en/US/prod/collateral/routers/ps10536/data\_sheet\_c78-553980\_ps10537\_Produ cts\_Data\_Sheet.html

### Where Cisco Office-in-a-Box Fits in the Deployment

Cisco Office-in-a-Box with VMware Horizon View can be centrally managed or fully distributed depending on how an organization needs to manage their VDI solution and whether the remote offices are connected back to the headquarters data center.

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Figure 1 shows a fully distributed VMware Horizon View solution.



Figure 1 Fully distributed VDI deployment

With a fully distributed VDI deployment, each remote office hosts a VMware Horizon View management infrastructure that consists of a VMware Horizon View connection server, Active Directory (AD) server, vCenter/View composer server, and SQL Express server. Table 1 lists virtual machine roles and configuration. Figure 2 shows the logical grouping of the required virtual machines.

Virtual Machine Role	Virtual Machine Specification	Notes
Microsoft Active Directory Domain Controller	1 virtual CPU (vCPU) with 2048 MB of RAM and Microsoft Windows Server 2008 R2 64-Bit Standard Edition	Microsoft Active Directory domain controller 1
VMware vCenter VMware Horizon View Composer Microsoft SQL Server 2008 R2 Express	2 vCPUs with 2048 MB of RAM and Microsoft Windows Server 2008 R2 64-Bit Standard Edition	VMware vCenter and Composer and Microsoft SQL services
View Connection Manager	2 vCPUs with 2048 MB of RAM and Microsoft Windows Server 2008 R2 64-Bit Standard Edition	VMware Horizon View Connection Manager 1
Atlantis ILIO	2 vCPUs (1 reserved) with 12GB of RAM	Atlantis ILIO storage optimization virtual machine
Virtual Desktop	1 vCPU with 1500 MB of RAM and Microsoft Windows 7	Virtual desktop virtual machine

Table 1Virtual Machine Roles and Configuration

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# <u>Note</u>

The CPU and RAM allocation for the virtual desktops is based on a medium workload profile. We recommend that performance testing be done based on applications that users will be running during normal peak business hours to identify virtual desktops resource allocation and virtual machine density per Cisco UCS E-Series server.

#### Figure 2 Logical Design



All virtual machines share the direct-attached storage (DAS) of the Cisco UCS E-Series blade.

Figure 3 shows a centralized VMware Horizon View management with distributed hosted virtual desktops.



#### Figure 3 Centralized VDI management with distributed VDI sessions

\* WAAS is recommended for limited bandwidth/high-latency WAN links

With central VDI management, only the desktop master image (template or master VM/snapshot) must reside on the Cisco UCS E-Series DAS to create desktop pools on the Cisco UCS E-Series server. Create the desktop master image with Horizon View Agent Direct-Connection. for branch users to access their hosted virtual desktops directly and not depend on the WAN connection to reach the VMware Horizon View connection server to access the hosted virtual desktops. Persistent pools (full clones) and nonpersistent pools (linked clones) are supported. Use Cisco WAAS to provision nonpersistent (linked clones) pools. During the creation of a nonpersistent pool, VMware provisioning and management traffic that flows on TCP port 902 between the View composer server and the ESXi VDI hosting node (Cisco UCS E-Series server) contains large data blocks and is very chatty across the WAN. Cisco WAAS can optimize this traffic and ensure a successful pool creation.

A Cisco WAAS solution provides a 99% reduction ratio of TCP 902 provisioning traffic and increases the apparent bandwidth available for the branch, which allows users at the branch office to continue using the WAN. After a VMware Horizon View VDI pool is created, Cisco WAAS can continue to optimize the access of centrally based applications across the WAN, like backup and restore tools.

To optimize VMware management and provisioning traffic, use this Cisco WAAS sample configuration:

# Note

This configuration must be applied at the data center Cisco WAAS and the branch Cisco WAAS appliances.

1. Create "class-map type" and label it "VMware".



2. Enter the global policy map Cisco WAAS configuration.



3. Configure the class-map type "VMware" for full optimization.



Figure 4 is an example of the optimization that is achieved when a linked-clone pool is created. Figure 5 shows the logical grouping of the virtual machines that are hosted on Cisco UCS E-Series server.

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branch#show statistic connection         Current Active Optimized Flows:       29         Current Active Optimized TCP Plus Flows:       16         Current Active Optimized TCP Preposition Flows:       0         Current Active Optimized TCP Preposition Flows:       0         Current Active Auto-Discovery Flows:       10         Current Active Pass-Through Flows:       0         Current Active Pass-Through Flows:       0         D:DRE,L:LZ,T:TCP Optimization RR:Total Reduction Ratio       3900         A:NOIN, C:CIFS, E:EPM, G:GENERIC, H:HTTP, I:ICA, M:MAPI,N:NFS, S:SSL, W:WAN SECURE,V:VII         E0       50         X: SMB Signed Connection       172.19.153.131:443 00:50:56:86:00:05 T       00.04         ConnID       Source IP:Port       Dest IP:Port       PeerID Accel RR         218001       172.19.153.148:6371       172.19.153.131:443 00:50:56:86:00:05 T       00.04         215722       172.19.153.148:6371       172.19.153.131:443 00:50:56:86:00:05 T       00.02         215723       172.19.153.148:6374       172.19.153.131:443 00:50:56:86:00:05 T       00.02         215729       172.19.153.148:63874       172.19.153.131:443 00:50:56:86:00:05 T       00.02         215729       172.19.153.148:63874       172.19.153.131:443 00:50:56:86:00:05 T       00.02         2157					
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Current Active Auto-Discovery Flows:         3           Current Reserved Flows:         10           Current Active Pass-Through Flows:         0           Historical Flows:         390           D:DRE,L:LZ,T:TCP Optimization RR:Total Reduction Ratio           A:AOIN,C:CIFS,E:EPH,G:GENERIC,H:HTTP,I:ICA,M:MAPI,N:NFS,S:SSL,W:WAN SECURE,V:VIT           EO           X: SMB Signed Connection           ConnID         Source IP:Port         Dest IP:Port         PeerID Accel RR           210803         10.1.1.152:49482         172.19.153.131:443         00:50:56:86:00:05 T         00.08           215721         172.19.153.148:60095         172.19.153.131:443         00:50:56:86:00:05 T         00.08           215721         172.19.153.148:6374         172.19.153.131:443         00:50:56:86:00:05 T         00.08           215722         172.19.153.148:63874         172.19.153.131:443         00:50:56:86:00:05 T         00.08           215728         172.19.153.148:63876         172.19.153.131:443         00:50:56:86:00:05 T         00.08           215729         172.19.153.148:63876         172.19.153.131:443         00:50:56:86:00:05 T         00.08           215729         172.19.153.148:63876         172.19.153.131:443         00:50:56:86:00:05 T         00.08           215731					
Current Reserved Flows:         10           Current Active Pass-Through Flows:         0           Historical Flows:         390           D:DRE,L:LZ,T:TCP Optimization RR:Total Reduction Ratio         A:AOIM, C:CIFS, E:EPM, G:GENERIC, H:HTTP, I:ICA, M:NAPI,N:NFS, S:SSL, W:WAN SECURE,V:VIE           EO         X: SMB Signed Connection           ConnID         Source IP:Port         Dest IP:Port         PeerID Accel RR           210803         10.1.1.152:49482         172.19.153.131:443         00:50:56:86:00:05 T         00.08           215721         172.19.153.148:60095         172.19.153.131:443         00:50:56:86:00:05 T         00.08           215722         172.19.153.148:60173         172.19.153.131:443         00:50:56:86:00:05 T         00.08           215722         172.19.153.148:63874         172.19.153.131:443         00:50:56:86:00:05 T         00.08           215729         172.19.153.148:63874         172.19.153.131:443         00:50:56:86:00:05 T         00.08           215720         172.19.153.148:63874         172.19.153.131:443         00:50:56:86:00:05 T         00.08           215730         172.19.153.148:63874         172.19.153.131:443         00:50:56:86:00:05 T         00.08           215731         172.19.153.148:63874         172.19.153.131:43         00:50:56:86:00:05 T	Curr	ent Active Optimized T	CP Preposition Flows:		
Current Active Pass-Through Flows: 0 Historical Flows: 390 D:DRE,L:LZ,T:TCP Optimization RR:Total Reduction Ratio A:AOIM,C:CIFS,E:EPM,G:GENERIC,H:HTTP,I:ICA,M:MAPI,N:NFS,S:SSL,W:WAN SECURE,V:VII EO X: SMB Signed Connection ConnID Source IP:Port Dest IP:Port PeerID Accel RR 210801 172.19.153.148:60095 172.19.153.131:443 00:50:56:86:00:05 T 00.04 214786 172.19.153.148:62183 172.19.153.131:443 00:50:56:86:00:05 T 00.04 215721 172.19.153.148:63771 172.19.153.131:443 00:50:56:86:00:05 T 00.04 215722 172.19.153.148:63771 172.19.153.131:443 00:50:56:86:00:05 T 00.04 215722 172.19.153.148:63771 172.19.153.131:443 00:50:56:86:00:05 T 00.04 215727 172.19.153.148:63874 172.19.153.131:443 00:50:56:86:00:05 T 00.04 215729 172.19.153.148:63875 172.19.153.131:443 00:50:56:86:00:05 T 00.04 215729 172.19.153.148:63875 172.19.153.131:443 00:50:56:86:00:05 T 00.04 215729 172.19.153.148:63879 172.19.153.131:443 00:50:56:86:00:05 T 00.04 215731 172.19.153.148:63879 172.19.153.131:443 00:50:56:86:00:05 T 00.04 215732 172.19.153.148:63879 172.19.153.131:443 00:50:56:86:00:05 T 00.04 215731 172.19.153.148:63879 172.19.153.131:443 00:50:56:86:00:05 T 00.04 215732 172.19.153.148:63879 172.19.153.131:443 00:50:56:86:00:05 T 00.04 215733 172.19.153.148:63879 172.19.153.131:443 00:50:56:86:00:05 T 00.04 215734 172.19.153.148:63879 172.19.153.131:443 00:50:56:86:00:05 T 00.04 215734 172.19.153.148:63914 172.19.153.131:902 00:50:56:86:00:05 T 00.04 215736 172.19.153.148:63914 172.19.153.131:902 00:50:56:86:00:05 TDL 99.67 215746 172.19.153.148:63914 172.19.153.131:902 00:50:56:86:00:05 TDL 99.67 215741 172.19.153.148:63914 172.19.153.131:902 00:50:56:86:00:05 TDL 99.67 215744 172.19.153.148:63914 172.19.153.131:902 00:50:56:86:00:05 TDL 99.67 215744 172.19.153.148:63914 172.19.153.131:902 00:50:56:86:00:05 TDL 99.67 215744 172.19.153.148:63921 172.19.153.131:902 00:50:56:86:00:05 TDL 99.67 215744 172.19.153.148:63921 172.19.153.131:902 00:50:56:86:00:05 TDL 99.67 215744 172.19.153.148:63921 172.19.153.131:902 00	Current	Active Auto-Discovery	Flows:	3	
Historical Flows:       390         D:DRE,L:LZ,T:TCP Optimization RR:Total Reduction Ratio         A:AOIM,C:CIFS,E:EPM,G:GENERIC,H:HTTP,I:ICA,M:MAFI,N:NFS,S:SSL,W:WAN SECURE,V:VII         EO         X: SNB Signed Connection         ConnID       Source IP:Port       Dest IP:Port       PeerID Accel RR         210801       172.19.153.131:443       00:50:56:86:00:05 T       00.08         210701       172.19.153.137:4001       00:50:56:86:00:05 T       00.08         214786       172.19.153.137:4001       00:50:56:86:00:05 T       00.08         215721       172.19.153.148:63771       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215722       172.19.153.148:63773       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215721       172.19.153.148:63875       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215721       172.19.153.148:63875       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215721       172.19.153.148:63875       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215732       172.19.153.148:63875       172.19.153.131:443       00:50:56:86:00:05 TD       00.08         215733       172.19.153.148:63815       172.19.153.131:443       00:50:56:86:00:05 TD <td>Current</td> <td>Reserved Flows:</td> <td></td> <td>10</td> <td></td>	Current	Reserved Flows:		10	
D:DRE,L:L2,T:TCP Optimization RR:Total Reduction Ratio         A:AOIM,C:CIFS,E:EPH,G:GENERIC,H:HTTP,I:ICA,M:MAPI,N:NFS,S:SSL,W:WAN SECURE,V:VII         EO         X: SMB Signed Connection         ConnID       Source IP:Port       Dest IP:Port       PeerID Accel RR         210801       172.19.153.148:60095       172.19.153.131:443       00:50:56:86:00:05 T       00.08         21721       172.19.153.148:6007       172.19.153.131:443       00:50:56:86:00:05 T       00.08         218721       172.19.153.148:63771       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215727       172.19.153.148:63773       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215726       172.19.153.148:63874       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215729       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215720       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215730       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215731       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05 TD       90.07         215734       172.19.153.148:63876       172.19.153.131:443			lows:		
A: AOIM, C: CIFS, E: EPN, G: GENERIC, H: HTTP, I: ICA, M: MAPI, N:NFS, S: SSL, W: WAN SECURE, V: VII         EO         X: SMB Signed Connection         ConnID       Source IP: Port       Dest IP: Port       PeerID Accel RR         210801       172.19.153.148:60095       172.19.153.131:443       00:50:56:86:00:05 TD       00.08         2117201       172.19.153.148:62183       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215721       172.19.153.148:63771       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215722       172.19.153.148:63874       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215728       172.19.153.148:63874       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215729       172.19.153.148:63874       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215730       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215731       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215731       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215733       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05 T       00.08	Histori	cal Flows:		390	
A: AOIM, C: CIFS, E: EPN, G: GENERIC, H: HTTP, I: ICA, M: MAPI, N:NFS, S: SSL, W: WAN SECURE, V: VII         EO         X: SMB Signed Connection         ConnID       Source IP: Port       Dest IP: Port       PeerID Accel RR         210801       172.19.153.148:60095       172.19.153.131:443       00:50:56:86:00:05 TD       00.08         2117201       172.19.153.148:62183       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215721       172.19.153.148:63771       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215722       172.19.153.148:63874       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215728       172.19.153.148:63874       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215729       172.19.153.148:63874       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215730       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215731       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215731       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215733       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05 T       00.08					
A: AOIM, C: CIFS, E: EPN, G: GENERIC, H: HTTP, I: ICA, M: MAPI, N:NFS, S: SSL, W: WAN SECURE, V: VII         EO         X: SMB Signed Connection         ConnID       Source IP: Port       Dest IP: Port       PeerID Accel RR         210801       172.19.153.148:60095       172.19.153.131:443       00:50:56:86:00:05 TD       00.08         2117201       172.19.153.148:62183       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215721       172.19.153.148:63771       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215722       172.19.153.148:63874       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215728       172.19.153.148:63874       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215729       172.19.153.148:63874       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215730       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215731       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215731       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215733       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05 T       00.08					
EO         X:         SMB         Signed Connection           ConnID         Source IP:Port         Dest IP:Port         PeerID Accel RR           210801         172.19.153.148:60095         172.19.153.131:443         00:50:56:86:00:05 T         00.08           210803         10.1.1.152:49482         172.19.153.131:443         00:50:56:86:00:05 T         00.08           215721         172.19.153.148:63771         172.19.153.131:443         00:50:56:86:00:05 T         00.08           215722         172.19.153.148:63771         172.19.153.131:443         00:50:56:86:00:05 T         00.08           215727         172.19.153.148:63874         172.19.153.131:443         00:50:56:86:00:05 T         00.08           215728         172.19.153.148:63876         172.19.153.131:443         00:50:56:86:00:05 T         00.08           215730         172.19.153.148:63876         172.19.153.131:443         00:50:56:86:00:05 T         00.08           215731         172.19.153.148:63876         172.19.153.131:443         00:50:56:86:00:05 T         00.08           215733         172.19.153.148:63876         172.19.153.131:443         00:50:56:86:00:05 T         00.08           215734         172.19.153.148:63876         172.19.153.131:443         00:50:56:86:00:05 TL         90.61           215					
X:       SMB       Signed Connection         ConnID       Source IP:Port       Dest IP:Port       PeerID Accel RR         210801       172.19.153.148:60095       172.19.153.131:443       00:50:56:86:00:05 T       00.04         210703       10.1.1.152:49482       172.19.153.131:443       00:50:56:86:00:05 T       00.04         215721       172.19.153.148:63771       172.19.153.131:443       00:50:56:86:00:05 T       00.04         215722       172.19.153.148:63773       172.19.153.131:443       00:50:56:86:00:05 T       00.04         215727       172.19.153.148:63874       172.19.153.131:443       00:50:56:86:00:05 T       00.04         215729       172.19.153.148:63875       172.19.153.131:443       00:50:56:86:00:05 T       00.04         215730       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05 T       00.04         215731       172.19.153.148:63879       172.19.153.131:443       00:50:56:86:00:05 T       00.04         215732       172.19.153.148:63879       172.19.153.131:443       00:50:56:86:00:05 T       00.04         215734       172.19.153.148:63915       172.19.153.131:402       00:50:56:86:00:05 TDL       99.67         215735       172.19.153.148:63915       172.19.153.131:902       00:50:56:86:00:05 TDL <td< td=""><td></td><td>C:CIFS,E:EPM,G:GENERIC,</td><td>H:HTTP, I:ICA, M:MAPI, H</td><td>N:NFS,S:SSL,W:WAN S</td><td>ECURE,V:VID</td></td<>		C:CIFS,E:EPM,G:GENERIC,	H:HTTP, I:ICA, M:MAPI, H	N:NFS,S:SSL,W:WAN S	ECURE,V:VID
ConnID         Source IP:Port         Dest IP:Port         PeerID         Accel         RR           210801         172.19.153.148:60095         172.19.153.131:443         00:50:56:86:00:05         T         00.08           214786         172.19.153.148:62183         172.19.153.131:443         00:50:56:86:00:05         T         00.08           215721         172.19.153.148:63771         172.19.153.131:443         00:50:56:86:00:05         T         00.08           215722         172.19.153.148:63773         172.19.153.131:443         00:50:56:86:00:05         T         00.08           215727         172.19.153.148:63874         172.19.153.131:443         00:50:56:86:00:05         T         00.08           215729         172.19.153.148:63876         172.19.153.131:443         00:50:56:86:00:05         T         00.08           215731         172.19.153.148:63876         172.19.153.131:443         00:50:56:86:00:05         T         00.08           215731         172.19.153.148:63876         172.19.153.131:443         00:50:56:86:00:05         T         00.08           215731         172.19.153.148:63876         172.19.153.131:443         00:50:56:86:00:05         T         00.08           215732         172.19.153.148:63876         172.19.153.131:443         00:50:5					
210801       172.19.153.148:60095       172.19.153.131:443       00:50:56:86:00:05       T       00.08         210803       10.1.1.152:49482       172.19.153.137:4001       00:50:56:86:00:05       TDL       84.58         214786       172.19.153.148:63771       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215721       172.19.153.148:63771       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215727       172.19.153.148:63874       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215728       172.19.153.148:63875       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215739       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215731       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215732       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215732       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215733       172.19.153.148:63891       172.19.153.131:443       00:50:56:86:00:05       TDL       99.63         215734	X: SMB	Signed Connection			
210801       172.19.153.148:60095       172.19.153.131:443       00:50:56:86:00:05       T       00.08         210803       10.1.1.152:49482       172.19.153.137:4001       00:50:56:86:00:05       TDL       84.58         214786       172.19.153.148:63771       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215721       172.19.153.148:63771       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215727       172.19.153.148:63874       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215728       172.19.153.148:63875       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215739       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215731       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215732       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215732       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215733       172.19.153.148:63891       172.19.153.131:443       00:50:56:86:00:05       TDL       99.63         215734		German TRePert	N+ ID-D+	D TD	
210803       10.1.1.152:49482       172.19.153.137:4001       00:50:56:86:00:05       TDL       84.5%         214786       172.19.153.148:62183       172.19.153.131:443       00:50:56:86:00:05       T       00.0%         215721       172.19.153.148:63771       172.19.153.131:443       00:50:56:86:00:05       T       00.0%         215722       172.19.153.148:63773       172.19.153.131:443       00:50:56:86:00:05       T       00.0%         215725       172.19.153.148:63874       172.19.153.131:443       00:50:56:86:00:05       T       00.0%         215729       172.19.153.148:63875       172.19.153.131:443       00:50:56:86:00:05       T       00.0%         215730       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05       T       00.0%         215731       172.19.153.148:63879       172.19.153.131:443       00:50:56:86:00:05       T       00.0%         215732       172.19.153.148:63891       172.19.153.131:443       00:50:56:86:00:05       T       00.0%         215734       172.19.153.148:63891       172.19.153.131:443       00:50:56:86:00:05       TDL       90.6%         215737       172.19.153.148:63914       172.19.153.131:902       00:50:56:86:00:05       TDL       99.6%         215737 <td></td> <td></td> <td></td> <td></td> <td></td>					
214786       172.19.153.148:62183       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215721       172.19.153.148:63771       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215727       172.19.153.148:63773       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215727       172.19.153.148:63874       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215729       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215730       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215731       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215732       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215733       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215734       172.19.153.148:63891       172.19.153.131:443       00:50:56:86:00:05       TDL       99.61         215736       172.19.153.148:63916       172.19.153.131:902       00:50:56:86:00:05       TDL       99.61         215741 <td></td> <td></td> <td></td> <td></td> <td></td>					
215721       172.19.153.148:63771       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215722       172.19.153.148:63773       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215726       172.19.153.148:63874       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215726       172.19.153.148:63875       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215726       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215730       172.19.153.148:63879       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215731       172.19.153.148:63879       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215732       172.19.153.148:63879       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215734       172.19.153.148:63816       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215735       172.19.153.148:63816       172.19.153.131:443       00:50:56:86:00:05       TD       99.66         215736       172.19.153.148:63914       172.19.153.131:902       00:50:56:86:00:05       TD       99.67         215741					
215722       172.19.153.148:63773       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215727       172.19.153.148:63874       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215728       172.19.153.148:63875       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215729       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215730       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215731       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215732       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215733       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215734       172.19.153.148:6386       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215735       172.19.153.148:63916       172.19.153.131:443       00:50:56:86:00:05       TD       99.68         215736       172.19.153.148:63916       172.19.153.131:902       00:50:56:86:00:05       TDL       99.61         215740					
215727       172.19.153.148:63874       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215728       172.19.153.148:63875       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215729       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215730       172.19.153.148:63879       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215731       172.19.153.148:63879       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215732       172.19.153.148:63864       172.19.153.131:443       00:50:56:86:00:05       T       00.04         215732       172.19.153.148:63864       172.19.153.131:443       00:50:56:86:00:05       T       00.04         215735       172.19.153.148:63864       172.19.153.131:443       00:50:56:86:00:05       T       00.04         215735       172.19.153.148:63891       172.19.153.131:443       00:50:56:86:00:05       TD       99.64         215736       172.19.153.148:63914       172.19.153.131:902       00:50:56:86:00:05       TDL       99.64         215740       172.19.153.148:63917       172.19.153.131:902       00:50:56:86:00:05       TDL       99.64         215741 </td <td></td> <td></td> <td></td> <td></td> <td></td>					
215728       172.19.153.148:63875       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215729       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215730       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215731       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215732       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215733       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215734       172.19.153.148:63890       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215736       172.19.153.148:63914       172.19.153.131:902       00:50:56:86:00:05       TDL       99.63         215736       172.19.153.148:63915       172.19.153.131:902       00:50:56:86:00:05       TDL       99.63         215740       172.19.153.148:63918       172.19.153.131:902       00:50:56:86:00:05       TDL       99.63         215741       172.19.153.148:63919       172.19.153.131:902       00:50:56:86:00:05       TDL       99.63         21574					
215729       172.19.153.148:63876       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215730       172.19.153.148:63879       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215731       172.19.153.148:63879       172.19.153.148:63874       00:50:56:86:00:05       T       00.08         215732       172.19.153.148:63874       172.19.153.148:63864       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215733       172.19.153.148:63864       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215735       172.19.153.148:63864       172.19.153.131:443       00:50:56:86:00:05       T       00.08         215736       172.19.153.148:63914       172.19.153.131:902       00:50:56:86:00:05       TDL       99.68         215736       172.19.153.148:63915       172.19.153.131:902       00:50:56:86:00:05       TDL       99.68         215740       172.19.153.148:63917       172.19.153.131:902       00:50:56:86:00:05       TDL       99.68         215741       172.19.153.148:63918       172.19.153.131:902       00:50:56:86:00:05       TDL       99.68         215744       172.19.153.148:63919       172.19.153.131:902       00:50:56:86:00:05       TDL       99.68					
215730       172.19.153.148:63879       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215731       172.19.153.148:63874       172.19.153.148:63874       00.08       00.08         215732       172.19.153.148:63874       172.19.153.148:63874       00.08       00.08         215733       172.19.153.148:63874       172.19.153.148:63874       172.19.153.148:63876       00.08         215734       172.19.153.148:63864       172.19.153.131:443       00:50:56:86:00:05 T       00.08         215735       172.19.153.148:63914       172.19.153.131:902       00:50:56:86:00:05 TDL       99.67         215736       172.19.153.148:63915       172.19.153.131:902       00:50:56:86:00:05 TDL       99.67         215740       172.19.153.148:63917       172.19.153.131:902       00:50:56:86:00:05 TDL       99.67         215741       172.19.153.148:63918       172.19.153.131:902       00:50:56:86:00:05 TDL       99.67         215742       172.19.153.148:63919       172.19.153.131:902       00:50:56:86:00:05 TDL       99.67         215743       172.19.153.148:63920       172.19.153.131:902       00:50:56:86:00:05 TDL       99.67         215744       172.19.153.148:63921       172.19.153.131:902       00:50:56:86:00:05 TDL       99.67         215744					
215731       172.19.153.148:6380       172.19.153.141.143.001.501.501.001.001.001.001.001.001.001					
215732       172.19.153.148:6354       Pool provisioning and management rafic       00.04         215733       172.19.153.148:6386       172.19.153.148:6386       00.04         215734       172.19.153.148:6386       172.19.153.131:443       00.50:56:66:00:05 T       00.04         215737       172.19.153.148:63890       172.19.153.131:443       00:50:56:86:00:05 TD       09.64         215737       172.19.153.148:63914       172.19.153.131:902       00:50:56:86:00:05 TDL       99.65         215739       172.19.153.148:63916       172.19.153.131:902       00:50:56:86:00:05 TDL       99.65         215740       172.19.153.148:63916       172.19.153.131:902       00:50:56:86:00:05 TDL       99.65         215741       172.19.153.148:63917       172.19.153.131:902       00:50:56:86:00:05 TDL       99.65         215741       172.19.153.148:63918       172.19.153.131:902       00:50:56:86:00:05 TDL       99.65         215742       172.19.153.148:63920       172.19.153.131:902       00:50:56:86:00:05 TDL       99.65         215744       172.19.153.148:63921       172.19.153.131:902       00:50:56:86:00:05 TDL       99.65         215745       172.19.153.148:63923       172.19.153.131:902       00:50:56:86:00:05 TDL       99.65         215746       172.19.153.148:63924 <td></td> <td></td> <td>172.19.153.131:443</td> <td>00:50:56:86:00:05</td> <td></td>			172.19.153.131:443	00:50:56:86:00:05	
215734       172.19.153.148:6386       172.10.153.141.443       nn.5n.5c.06; nn.5 r       00.08         215735       172.19.153.148:63890       172.19.153.131:443       00:50:56:46:00:05 T       00.04         215736       172.19.153.148:63914       172.19.153.131:902       00:50:56:86:00:05 TDL       99.64         215736       172.19.153.148:63915       172.19.153.131:902       00:50:56:86:00:05 TDL       99.64         215739       172.19.153.148:63916       172.19.153.131:902       00:50:56:86:00:05 TDL       99.64         215740       172.19.153.148:63917       172.19.153.131:902       00:50:56:86:00:05 TDL       99.64         215741       172.19.153.148:63918       172.19.153.131:902       00:50:56:86:00:05 TDL       99.64         215742       172.19.153.148:63919       172.19.153.131:902       00:50:56:86:00:05 TDL       99.64         215743       172.19.153.148:63920       172.19.153.131:902       00:50:56:86:00:05 TDL       99.64         215744       172.19.153.148:63921       172.19.153.131:902       00:50:56:86:00:05 TDL       99.64         215745       172.19.153.148:63923       172.19.153.131:902       00:50:56:86:00:05 TDL       99.64         215745       172.19.153.148:63923       172.19.153.131:902       00:50:56:86:00:05 TDL       99.64			172.19.133.131.443	00:30:30:00:00:03	
215734       172.19.153.148:6386       172.10.153.141.443       nn.5n.5c.06; nn.5 r       00.08         215735       172.19.153.148:63890       172.19.153.131:443       00:50:56:46:00:05 T       00.04         215736       172.19.153.148:63914       172.19.153.131:902       00:50:56:86:00:05 TDL       99.64         215736       172.19.153.148:63915       172.19.153.131:902       00:50:56:86:00:05 TDL       99.64         215739       172.19.153.148:63916       172.19.153.131:902       00:50:56:86:00:05 TDL       99.64         215740       172.19.153.148:63917       172.19.153.131:902       00:50:56:86:00:05 TDL       99.64         215741       172.19.153.148:63918       172.19.153.131:902       00:50:56:86:00:05 TDL       99.64         215742       172.19.153.148:63919       172.19.153.131:902       00:50:56:86:00:05 TDL       99.64         215743       172.19.153.148:63920       172.19.153.131:902       00:50:56:86:00:05 TDL       99.64         215744       172.19.153.148:63921       172.19.153.131:902       00:50:56:86:00:05 TDL       99.64         215745       172.19.153.148:63923       172.19.153.131:902       00:50:56:86:00:05 TDL       99.64         215745       172.19.153.148:63923       172.19.153.131:902       00:50:56:86:00:05 TDL       99.64			Pool provisioning and	d management traffi	00.0%
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	215751	172.19.153.148:63928	172.19.153.131:902	00:50:56:86:00:05	TDL 99.5

Figure 4 Example of optimization achieved with a linked-clone pool

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#### Figure 5 Cisco UCS E-Series Logical Design

At the branch, the Cisco UCS E-Series server hosts the master desktop image from where a pool of desktops would be provisioned using the central VMware Horizon View management tools. The VMware Horizon View management infrastructure is the same infrastructure used to provision and manage VDI pools that are based in the campus or data center.

#### **Requirements, Solution, and Benefits**

This sample of requirements, solutions, and benefits can help you decide to move forward with a Cisco Office-in-a-Box deployment.

Requirement: VDI solution for 10 to 25 users at the branch office or retail office

**Solution**: Cisco UCS E-Series with Cisco ISR G2 provides the network, compute and storage platform to locally host and manage VDI sessions without user-experience degradation due to WAN link traffic saturation or WAN outage.

#### **Benefits**:

- Mission-critical applications are not reliant on the WAN.
- Best VDI user experience because VDI sessions are local to the users.
- VDI data traffic can be managed so that packets traverse the router interfaces via backplane to apply security policies and determine how each virtual machine or user accesses applications.
- Single device to manage at each remote site with the ability to manage all onboard applications, unified communications, security, and network access remotely

# **Basic VDI Concepts - Understanding the Terminology**

The concept of VDI technology is to abstract the operating system off of an end-user compute platform and host that operating system on a centralized compute server. The centralized compute server must have sufficient compute resources to host and run multiple instances of the operating system. (A virtual desktop instance is a single OS instance on the centralized server.) After the centralization of the operating system is achieved, end users are provided with the necessary software client to connect to their assigned virtual desktop instance over the network. When the desktop of an end user is centralized and the user can connect to that desktop across the network, the user can access the desktop from anywhere on any type of device. Also, the data that is running within the desktop is protected. The data is not stored on the local device, but it is stored safely on the central storage system that can be backed up and accessed at any time.

# **Deploying Cisco Office-in-a-Box**

Cisco Office-in-a-Box relies on Cisco ISR and Cisco UCS E-Series service modules to deliver the necessary compute resources to host a VMware Horizon View VDI solution. Table 2 lists the required specifications of a 6-core Cisco UCS E-Series and a 4-core Cisco UCS E-Series service module to support a maximum of 25 VDI sessions and 15 VDI sessions, respectively.

Feature	Cisco UCS E140D, Cisco UCS E140DP (4-core Double-wide)	Cisco UCS E160D, Cisco UCS E160DP (6-core Double-wide)	
CPU	Intel Xeon E5-2418L 2.0-GHz quad-core processor	Intel Xeon E5-2418L 2.0-GHz quad-con processor	
DRAM	48 GB RAM	48 GB RAM	
Hard-disk drive (HDD)	Up to three (Cisco UCS E140D or E160D) or two (Cisco UCS E140DP or E160DP):	Up to three (Cisco UCS E140D or E160D) or two (Cisco UCS E140DP or E160DP):	
	• 10,000-rpm SAS: 900 GB	• 10,000-rpm SAS: 900 GB	
	• 10,000-rpm SAS SED: 600 GB	• 10,000-rpm SAS SED: 600 GB	
	• SAS SSD SLC: 200 GB	• SAS SSD SLC: 200 GB	
	See Note	See Note	
Supported Cisco ISRs	Cisco UCS E140D and E140DP: Cisco 2921, 2951, 3925, 3925E, 3945, and 3945E	• Cisco UCS E160DP and E160DP: Cisco 3925, 3925E, 3945, and 3945E	
PCIe	Cisco UCS E140DP and E160DP: Four 1 Gigabit Ethernet or one 10 Gigabit Ethernet and Fibre Channel over Ethernet (FCoE)	Cisco UCS E140DP and E160DP: Four 1 Gigabit Ethernet or one 10 Gigabit Ethernet and FCoE	

 Table 2
 Cisco UCS E-Series Configuration for VDI

The Cisco UCS E-Series storage configuration depends on how many VDI sessions you intend to host on the Cisco UCS E-Series server and the type of workload the branch users will be exercising on each virtual machine. A three-drive SAS (900 GB, 10K rpm) RAID 5 configuration was tested successfully for a 25 VDI session configuration at a medium workload profile. The medium workload profile consists of a basic Microsoft Office suite, printing, PDF reading, web-browsing, Microsoft Exchange email, and creating and saving documents. The medium workload profile does not include video or high graphics applications, which is part of the expert user workload profile.

### Managing Horizon View Agent Direct-Connection on the Branch Hosted Virtual Desktop Master Image

The Horizon View Agent Direct-Connection software is installed with the VMware Horizon View agent 5.3 software. Depending on the release date of your VMware View agent 5.3 software, the Horizon View Agent Direct-Connection plug-in may be a separate install file. The VMware Horizon View agent software is installed to the hosted virtual desktop master image that will be used to create the VDI pool on the Cisco UCS E-series server.. The difference in the Horizon View Agent Direct-Connection software, compared to older VMware view agent software, is the ability to allow VMware View clients to directly connect to the hosted virtual desktop without having to authenticate with the VMware Horizon View agent Software Software Software Software View client device can point directly to the hosted virtual desktop IP address or FQDN and log in to the hosted virtual desktop using Microsoft Windows local credentials or cached credentials. The ability to fall back or always directly connect to the locally hosted virtual desktop allows VMware VDI users to access their virtual desktops even if the WAN connection is down and the VMware Horizon View connection server is not reachable. The branch users are always able to connect to their desktop no matter the state of the WAN connection. The status and management of the remote hosted virtual desktops resumes at the central VMware Horizon view connection server once the WAN connection is back up.

In order to automate the process of selecting either the VMware Horizon view connection server across the WAN or the user assigned virtual desktop that is locally running in Cisco UCS E-series, the VMware View client software can be modified to present the alternative authentication server adresses. Below is an example of how to configure VMware Horizon view client software registry in a Windows 7 thick-client or Windows embedded Thin-Client in order to list the VMware Horizon view connection server address and the locally assigned VMware Horizon view hosted virtual desktop address.

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Open "regedit" using the Windows start menu.

Programs (1)	
💣 regedit	
Microsoft Outlook (28)	
📄 FW: Routing Strategy R	eview deck
🎒 Cisco UCS E-Series Casi	e Studies.pptx (FW: Routing Strategy Revi.
🚔 FW: [UCS E-Series] - use	e case with Point of Sales solutions
🎒 SIAB ISR & UCS-E Lab V	Validation Example - Grocery.pptx (FW: [
📄 FW: [UCS E-Series] - use	e case with Point of Sales solutions
🎒 SIAB ISR & UCS-E Lab V	Validation Example - Grocery.pptx (FW: [
🚖 RE: Upcoming Ontario	Alpha user study
🚔 RE: Help on Citrix recei	ver
RE: 6215 configuration	- Need help
Re: 6215 configuration	- Need help
📄 Re: 6215 configuration	- Need help
RE: found this	
😭 RE: Update	
P See more results	
regedit	× Shut down +

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If in your environment you have VMware soft View Clients installed either on full-blown Windows or on Thin Client with Windows embedded, you may use the registry key "BrokerHistory" to add multiple existing connections brokers.

You can create the key under [HKEY\_CURRENT\_USER\Software\VMware, Inc.\VMware VDM\Client]. However, because this is a USER registry key you will need to merge the registry changes during logon time trough scripts or GPO.

le Edit View Fgvorites Help				
McAfee     McAfee     Microsoft     Mozilla     MozillaPlugins     MozillaPlugins	*	Name (Default) DialogPos BrokerHistory	Type REG_SZ REG_SZ REG_MULTI_SZ	Data (value not set) 718,229 10.30.20.100 192.168.24.10

After creating this key the VMware view client automatically lists he available servers for login.

Solution View Clie	nt	X
Vmware VMwar		
Enter the host name o	f the View Connection Server.	
Connection Server:	10.30.20.100	-
Log in as current u	10.30.20.100 \$192.168.24.101	
Connect	E <u>x</u> it <u>H</u> elp	Qptions >>

### **Atlantis ILIO Deployment Option**

For high-density virtual desktop deployments or expert user workload profiles (with high I/O operations per second [IOPS] workloads), we recommend that you install Atlantis ILIO technology on the Cisco UCS E-Series server to boost IOPS performance using SAS 10K RPM hard drives. Atlantis ILIO has the following benefits:

- Deploy up to 35 high-performance virtual desktops on a single Cisco E-Series server module.
- Lower the cost per virtual desktop using Atlantis ILIO with SAS disks.
- Deliver a better-than-PC user experience.

For more Atlantis ILIO information, see: http://www.atlantiscomputing.com/products/

#### **Installing Cisco Office-in-a-Box**

First, an administrator must install VMware ESXi on the Cisco UCS E-Series service module. The Cisco UCS E-Series management tool, the Cisco Integrated Management Controller, has multiple options on how to install an operating system on to the server. This procedure explains how to mount an ESXi image on the available SD card using the "host image mapping" capability on the Cisco UCS E-Series server and how to start the installation of ESXi off of the mounted image. An FTP or HTTP server is required to host the ESXi install files in bootable ISO format.

1. Log into the Cisco Integrated Management Controller.



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The default username and password is "admin" and "password".

2. In the Server tab, click Host Image Mapping.



The Host Image Mapping screen opens.

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cisco Cisco Integ	rated Management Controller				
Overall Server Status	C   🧶 🗮   🛛 O				
Good	Host Image Mapping				
Server Admin	Existing Image info				
Summary	Image Name: ESXi-5.1.0-799733-custom-Cisco-2.1.0.3.iso				
Inventory	Image Size: 315633664				
Sensors	MD5 Checksum: 6e9efaa7bfbc32a0e979c021644256e1				
System Event Log	Last Modified Time : 6e9efaa7bfbc32a0e979c021644256e1				
Remote Presence					
BIOS	/Install Pane				
Power Policies	Enter the URL and file information, and then click 'Download' to begin the download. Click 'Map Image to Host' to mount the host image or click 'Map Diagnostics to Host' to mount the diagnostics Image. URL syntax:				
Fault Summary	protocol://username:password@server-ip-address/path, Username and Password are optional				
Host Image Mapping	URL:				
	Image Name				
	Download Map Image to Host Unmap Image Map Diagnostics to Host Delete Image				
	Host Image Update				
	Status: Image mapped successfully,Please set CDROM as the Boot device				

**3.** In the URL field, enter the full image name including the extension. Click **Download**. When the download is complete, click **Map Image to Host**.

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Overall Server Status	C   🐮 🛃   😟 🖯				
Good	Host Image Mapping				
Server Admin	Existing Image info				
Summary	Image Name:				
Inventory	Image Size:				
Sensors	MD5 Checksum:				
System Event Log	Last Modified Time :				
Remote Presence					
BIOS	/Install Pane				
Power Policies	Enter the URL and file information, and then click 'Download' to begin the download. Click 'Map Image to Host' to mount the host image or click 'Map Diagnostics to Host' to mount the diagnostics Image. URL syntax:				
Fault Summary	protocol://username:password@server-ip-address/path, Username and Password are optional				
Host Image Mapping	URL: ftp://anonymous:cisco@15.10.1.3/				
	Image Name ESXi-5.1.0-799733-custom-Cisco-2.1.0.3.i				
	Download Map Image to Host Unmap Image Map Diagnostics to Host Delete Image				
	Host Image Update				
	Status: Image mapped successfully,Please set EFI as the Boot device				

4. In the Server tab, click **BIOS** and update the boot order so that CDROM is the highest priority. (Host image map acts as a virtual CDROM when it is mounted.)

cisco Cisco Integ	grated Management Controller			CIMC Hostnam Logged in a
Overall Server Status Server Admin Summary Inventory Sensors System Event Log Remote Presence Power Policies Fault Summary Host Image Mapping	C Configure BLOS Configure BLOS Configure BLOS Configure BLOS Clear BLOS CMOS Clear BLOS CMOS Clear BLOS CMOS Clear BLOS Password Activate backup BLOS Firmware Actions Install BLOS Firmware through Browser Cleant Install BLOS Firmware through Browser Cleant Last Firmware Install Status: Completed Successfully	BIOS Properties Running Version: 4.6.4.8 Boot Order Configured Boot Order 1. ○ CDROW 2. ■ HOD 1. ○ CDROW 2. ■ HOD 2. ■ Network Device ( 0. Internal EFI Shell	Eri Remove	

5. Launch the KVM console for the server and reload server. From the Server tab, click Summary > Launch KVM Console > Power Cycle Server.

ullully Cieco Inter	rated Management Co	ptrollor		CIMC Hostname: Un
cisco Cisco Integ	nateu Management Co	nuoner		🔲 15.10.1.10 - KVM Console
Overall Server Status	c   1 4 🔳   0 0			File View Macros Tools Help
Good				KVM Virtual Media
	Server Summary			PXE-E51: No DHCP or proxyDHCP offers were received.
Server Admin	Actions	Server Properties		PXE-MOF: Exiting Broadcom PXE ROM.
Summary	Power On Server	Product Name:	E140D	
Inventory	Power Off Server	Serial Number:	FOC16372B56	Broadcom UNDI PXE-2.1 v15.0.11
Sensors	Power Off Server	PID:	UCS-E140D-M1/	Copyright (C) 2000-2011 Broadcom Corporation
System Event Log	Shut Down Server			Copyright (C) 1997-2000 Intel Corporation
Remote Presence	C Power Cycle Server	BIOS Version:	4.6.4.8	All rights reserved.
BIOS	Hard Reset Server	Description:		CLIENT MAC ADDR: D8 67 D9 C7 A2 EB GUID: D867D9C7 A2EE 0000 DE8C 634EDEBADD4F PXE-E51: No DHCP or proxuDHCP offers were received.
Power Policies	Launch KVM Console	Server Status	_	
Fault Summary	Lock Front Panel Power Button	Power State:	O On	PXE-M0F: Exiting Broadcom PXE ROM.
Host Image Mapping		Overall Server Status:	Good	
	Lock IOS Configuration Changes	Processors:	Good	Broadcom UNDI PXE-2.1 v15.0.11 Copyright (C) 2000-2011 Broadcom Corporation
		Memory:	Good	Copyright (C) 2000-2011 Broadcom Corporation Copyright (C) 1997-2000 Intel Corporation
		Ciese Internated Manage		All rights reserved
		Hostname:		PXE-EG1: Media test failure, check cable PXE-MOF: Exiting Broadcom PXE BOM.
			15.10.1.10	
				Reboot and Select proper Boot device or Insert Boot Media in selected Boot device and press a key
		Firmware Version:		
		CPLD Version:		1064607
		Hardware Version:		
		Current Time (UTC):		1-21 2013
		content time (orc):	Wed Hpr 3 10:3	11.21 2013

The server boots from the VMware ESXi bootable image.

6. Follow the VMware ESXi installation wizard.

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7. After ESXi installation is complete, unmap the ESXi boot image from the server to prevent a new fresh install. Click **Unmap Image**. (Deleting the image is optional.)

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cisco Integ	rated Management Controller
CISCO Contractory Overall Server Status Server Admin Summary Inventory Sensors System Event Log Remote Presence BIOS Power Policies Fault Summary Host Image Mapping	C C C Control of the

The VMware ESXi install is complete.

8. Reload the router and configure VMware ESXi for network access.



To install VMware Horizon View using the fully distributed model, VMware offers the VMware Rapid Desktop Appliance solution that enables quick and easy provisioning of the entire VDI solution on a partner certified solution. The Cisco UCS E-Series server has been validated by VMware and is available using VMware Horizon View 5.1 or 5.2. The Cisco UCS E-Series node requires VMware vSphere/ESXi 5.0 or higher.

#### VMware Rapid Desktop Program Validation



Cisco ISR/UCS-E series Office in a Box

- Validation testing was performed on a Cisco UCSE-160D with SSD drives
- The Cisco UCS E-series server hosted VDI infrastructure and desktop components
- For the validated design 25 virtual desktops were deployed and tested with a heavy knowledge worker profile
- This design also applies to a deployment of up to 50 desktops in a branch or remote office scenario
- Test tools used for validation were VMware

VMWARE PARTNER NETWORK VMware View Rapid Desktop Program VMware Ecosystem Engineering	Resource Pool           Vew           vCenter           Vew           Connection           Manager           Vew           Composer           SQL           SQR           Express           File & Print Server	Resource Pool           Will VM         VM         VM         VM           VM         VM         VM         VM         VM
White Paper Reference: http://www.cisco.com/en/US/prod/collateral/ps10265/ps12629/white_paper_c11-715347.html		VSphere UCS-E 1600

For information on the VMware Rapid Desktop Appliance solution, see: http://www.vmware.com/solutions/desktop/rapid-desktop.html

To install a VMware Horizon View solution with central management and distributed VDI sessions, VMware Horizon View 5.2 must be installed at the headquarters or data center site. For installation guide and system requirements, see:

http://pubs.vmware.com/view-52/topic/com.vmware.ICbase/PDF/horizon-view-52-installation.pdf.

The Cisco UCS E-Series server requires VMware vSphere/ESXi 5.1 and the server must be added as a host to the data center vCenter. We recommend that each Cisco UCS E-Series server be staged at headquarters with the appropriate VMware ESXi install and desktop master image (virtual machine template) that will be used for VDI pool creation. Staging the Cisco UCS E-Series server prevents the need for transferring large files across the WAN.

After the Cisco UCS E-Series server is installed and running at the remote office with connectivity back to the data center, the administrator adds the Cisco UCS E-Series VMware ESXi host to vCenter so that the Cisco UCS E-Series server can participate as a resource platform for desktop pool creation. Using the VMware Horizon View management application, an administrator creates a desktop pool by selecting the desktop master image hosted on the Cisco UCS E-Series server as the template for the pool. Then the administrator selects the Cisco UCS E-Series compute resource as the hosting node for the pool. The pool can be created as full clones of the master image or as linked clones. In VMware Horizon View, full clone pools deliver persistent desktop pools where each individual desktop virtual machine is dedicated to an entitled user. Linked-clone pools deliver nonpersistent desktop pools where a group of

users are entitled to the pool of linked-clones desktops and are connected to any desktop that is available in the pool. With linked clones, no user data or personalization of the desktop is saved after a user logs out of the VDI session.

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To create a VDI pool using VMware Horizon View, follow these steps:

(This example shows linked clones.)

Note

If you plan to test with Atlantis ILIO, first install Atlantis ILIO on your Cisco UCS E-Series server. See "Atlantis ILIO Installation and Configuration" section on page -31.

1. Log into the VMware Horizon View management console, and click Pools and Add.

VMware Horizon View	Administrato	r				
Updated 4/16/2013 11:45 AM 🛛 🧞	Pools					
Remote Sessions     0       Local Sessions     0       Problem Desktops     0       Events     0     1     0	Add Edit	Delete []	Entitlements	• Status 🛛 🕶 Fol	der 🗸 🗸	lore Commands
System Health	Filter 👻		Find Cl	ear Folder:	All 🔻	
	ID	Display Name	Туре	Source	User Assi	vCenter Server
Inventory	🛄 full-clone-pool	full-clone-pool	Automated Pool	vCenter	Dedicated	172.19.153.148
🔗 Dashboard						
👸 Users and Groups						
▼ Inventory	-					
I Pools						
Desktops	-					
Persistent Disks						
<ul> <li>Monitoring</li> </ul>						
<ul> <li>Policies</li> </ul>						
<ul> <li>View Configuration</li> </ul>						
, the construction						



2. Click Type, select Automated Pool, and click Next.

3. Click User Assignment, select Dedicated and Enable automatic assignment, and click Next.



Pool Definition	vCenter Server		
Туре	<ul> <li>Full virtual machines</li> </ul>		View Composer
User Assignment vCenter Server	<ul> <li>View Composer linked clor</li> </ul>	ies	View Composer linked clones share the same base image and
vCenter Server Setting Pool Identification Pool Settings Provisioning Settings View Composer Disks Storage Optimization vCenter Settings Advanced Storage Options Guest Customization Ready to Complete	View Composer linked clor vCenter Server 172.19.153.148(administrat or)	View Composer	share the same base image and use less storage space than full virtual machines. The user profile for linked clones can be redirected to persistent disks that will be unaffected by OS updates and refreshes. Supported Features Local Mode PCOIP Storage savings Recompose and refresh QuickPrep guest
	Description: SRG TME vCenter		<ul> <li>customization</li> <li>Sysprep guest customization (vSphere 4.1 or higher)</li> <li>Persona management</li> <li>&lt; Back Next &gt; Cancel</li> </ul>

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4. Click vCenter Server and select View Composer linked clones.

5. Click Pool Identification. Name your VDI pool, and click Next.

Add Pool - linkclone-pool			?
Pool Definition	Pool Identification		
Туре	ID:	linkdone-pool	ID
User Assignment	Display name:	linkclone-pool	The pool ID is the unique name
vCenter Server Setting			used to identify this pool.
Pool Identification	View folder:	<b>∀</b>	Display Name
Pool Settings Provisioning Settings View Composer Disks Storage Optimization	Description:		The display name is the name that users will see when they connect to View Client. If the display name is left blank, the ID will be used.
vCenter Settings			View Folder
Advanced Storage Options Guest Customization Ready to Complete			View folders can organize the pools in your organization. They can also be used for delegated administration. Description
			·
			This description is only shown on the Settings tab for a pool within View Administrator.
			< Back Next > Cancel

6. Click Pool Settings. Keep the pool settings defaults and click Next. For information about pool settings and how to manage them, see the VMware Horizon View Administration Guide. http://pubs.vmware.com/view-52/topic/com.vmware.ICbase/PDF/horizon-view-52-administration.pdf

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Add Pool - linkclone-pool		(
Pool Definition	Pool Settings	
Type User Assignment vCenter Server	General State:	Enabled   -
Setting Pool Identification	Connection Server restrictions:	None Brawse
Pool Settings	Remote Settings	
Provisioning Settings View Composer Disks	Remote Desktop Power Policy:	Take no power action 🛛 🗸
Storage Optimization vCenter Settings Advanced Storage Options	Automatically logoff after disconnect:	Never 🔻
Guest Customization Ready to Complete	Allow users to reset their desktops:	No 🗸
Ready to complete	Refresh OS disk after logoff:	Never V
	Remote Display Protocol	
	Default display protocol:	PCoIP 🗸
	Allow users to choose protocol:	Yes V
	3D Renderer:	Disabled Configure 3
	Max number of monitors:	2   • 3
		May require power-cycle of related virtual machines (2)
	Max resolution of any one monitor:	1920×1200   🔹 🕜
		May require power-cycle of related virtual machines 🛛 🧿
	HTML Accord	Laphad

7. Click **Provisioning Settings**. Enter a naming pattern for the new VDI virtual machines and the number of virtual machines to create.



8. Click View Composer Disks. Keep the default values, and click Next.

Add Pool - linkclone-pool			
Pool Definition	View Composer Disks		
Type User Assignment vCenter Server Setting Pool Identification Pool Settings Provisioning Settings	<ul> <li>Persistent Disk</li> <li>Redirect Windows profile to a persistent disk</li> <li>Disk size: 2048 MB (minimum 128 MB)</li> <li>Drive letter: D</li> <li>Do not redirect Windows profile</li> </ul>		
View Composer Disks Storage Optimization	Disposable File (2) Redirection		
vCenter Settings Advanced Storage Options	• Redirect disposable files to a non-persistent disk		
Guest Customization Ready to Complete	Disk size: 4096 MB (minimum 512 MB)		
Ready to complete	Drive letter: Auto 🛛 🔻 📀		
	<ul> <li>Do not redirect disposable files</li> </ul>		

- 9. Click Next through Storage Optimization.
- **10.** Click **vCenter Settings**. Select the parent virtual machine (the virtual machine template) and snapshot. For the resource pool, select the Cisco UCS E-Series server. For storage, select the Cisco UCS E-Series DAS.

Add Pool - linkclone-pool						
Pool Definition	vCenter Settings					
Type User Assignment	Default Image					
vCenter Server	1 Parent VM:	/SRGTME-Lab/vm/win7-msoffice-lvsi	Browse			
Setting Pool Identification	2 Snapshot:	/SNAP-1/win7-ms-snapshot	Browse			
Pool Settings	Vi <sup>-</sup> tual Machine Location					
Provisioning Settings View Composer Disks Storage Optimization	3 VM folder location:	/SRGTME-Lab/vm	Browse			
vCenter Settings	Resource Settings					
Advanced Storage Options Guest Customization	4 Host or cluster:	/SRGTME-Lab/host/172.19.153.131	Browse			
Ready to Complete	5 Resource pool:	/SRGTME-Lab/host/172.19.153.131/Re	Browse			
	6 Datastores:	1 selected	Browse			
	Note: 172.19	.153.131 is the UCSE IP address				

#### 11. Click Advanced Storage Options. Keep the default values, and click Next.

Pool Definition	Advanced Storage Options			
Type User Assignment	Based on your resource select recommended. Options that a	View Storage Accelerator		
vCenter Server Setting Pool Identification	hardware are disabled.  Use View Storage Accelera	ator	vSphere 5.x hosts can be configured to improve performance	
Pool Settings Provisioning Settings	Disk Types:	OS disks 🛛 🔻	by caching certain poo data. Enable this option to use View	
View Composer Disks Storage Optimization	Regenerate storage accelerator after:	7 Days	Storage Accelerator fo this pool. View Storag	
vCenter Settings Advanced Storage Options	Other Options		useful for shared disk: that are read	
Guest Customization Ready to Complete	<ul> <li>Use native NFS snapsh</li> <li>Reclaim VM disk space</li> </ul>		frequently, such as View Composer OS disks.	
	Initiate reclamation when unused space on VM exce	eds: GB	Native NFS Snapshot (VAAI)	
	not occur during blackout time both operations.	tion and VM disk space reclamation do es. The same blackout policy applies to emove	VAAI (vStorage API fo Array Integration) is a hardware feature of certain storage arrays It uses native snapshotting technology to provide linked clone functionality. Choose this option only if you have appropriate hardware devices.	
			Disk Space Reclamation	

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12. The AD domain should be automatically selected, so leave AD container set to the default.

You can use QuickPrep or Sysprep to tailor each created virtual machine for use (computer name, domain registration). This example uses Sysprep using a prepared vCenter Windows customization template. See the *vSphere Virtual Machine Administration* guide to learn more on customization templates: http://www.vmware.com/support/pubs/vsphere-esxi-vcenter-server-pubs.html

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Add Pool - linkclone-pool				(?)
Pool Definition	Guest Customization			-
Туре				2
User Assignment	Domain:	SRTGTME.COM(administrat	tor) 🔻	
vCenter Server				
Setting	AD container:	CN=Computers	Browse	
Pool Identification Pool Settings	Allow reuse of pre-existing	computer accounts		
Pool Settings Provisioning Settings				
View Composer Disks	🔘 Use QuickPrep			
Storage Optimization	Power-off script name:			
vCenter Settings	i enter en senperiamer			
Advanced Storage Options	Power-off script parameter	rs:	Examp	ole: p1 p2 p3
Guest Customization	Post-synchronization script	t name:	2	
Ready to Complete	r ooc ojnon oneodon oonp			
	Post-synchronization script	t parameters:	Examp	ole: p1 p2 p3
	<ul> <li>Use a customization specif</li> </ul>	ication (Syspren)		
		icadon (Sysprep)		
	Show all customization	specifications 👔		
	Name	Guest OS	Descripti	on
	vmware-win7-template	Windows		
			< Back Nex	t > Cancel

- 13. Click Next.
- 14. Verify settings, and click Finish. The virtual machine pool is now created.

## **Atlantis ILIO Installation and Configuration**

A preconfigured Atlantis ILIO installation for deployment on the Cisco UCS E-Series server is being developed and will be available soon.

#### To install and configure Atlantis ILIO, follow these steps:

- 1. Import the Atlantis ILIO Persistent VDI v3.2 Open Virtualization Format (OVF).
- 2. Configure the Atlantis ILIO virtual machine with these configuration settings:

Storage Utilized for Atlantis ILIO Appliance(First Virtual Disk)	5 GB
Storage Allocated by Atlantis ILIO for the Desktops	All available storage from local disks (3x 900GB SAS disk in RAID-5)
(Second Virtual Disk)	(See Cisco UCS E-Series datasheet for available SAS drive configurations.)
Memory Allocated for the Appliance	8 GB
vCPUs Allocated	2 vCPU, with reservation of one vCPU

- **3.** Power on the Atlantis ILIO virtual machine and log in on the console (username: poweruser, password: poweruser).
- 4. Use the in-console setup wizard to set up networking, hostname, timezone, etc:
  - a. Use DHCP or static for the first interface.
  - **b.** Enter the hostname for this virtual machine.
  - c. Enter the correct timezone.
  - d. Configure keymap. (Select Don't touch keymap unless you know what you are doing.)
  - e. Before you press Next, press Ctrl-C. The advanced configuration file for Atlantis ILIO opens. Use the editor to change VMDATA\_CACHE\_ON: True to VMDATA\_CACHE\_ON: False. Press Ctrl-X to save the file to /etc/ilio/config.yml. Select yes to overwrite.
  - f. Continue with the configuration wizard. Select **Persistent** as the deployment option, **Local Disk** as the Storage Type, and /dev/sdb as the datadisk.

You might get a message that says that the resources might not be sufficient. Ignore the message and continue the set up.

- 5. Select NFS as the datastore type to mount to ESXi.
- 6. Create a datastore in vSphere on the Cisco UCS E-Series server using the IP address information from step 4a. The mount path is /exports/ILIO\_VirtualDesktops.
- 7. Use your standard virtual desktop provisioning tools to provision virtual desktops in the Atlantis ILIO datastore.

### **Atlantis ILIO Test Results**

#### Iometer

Iometer is an I/O subsystem measurement and characterization tool for single and clustered systems. Iometer was developed by the Intel Corporation and announced at the Intel Developers Forum (IDF) on February 17, 1998. Since then it has been widely adopted within the industry.

Meanwhile, Intel has discontinued work on Iometer and it was given to the Open Source Development Lab (OSDL). In November 2001, a project was registered at SourceForge.net and an initial drop was provided. In February 2003, the project was relaunched and is driven by an international group of individuals who are continuously improving, porting, and extending the product. Table 3 lists Iometer test specifications and Figure 6 shows an Iometer test on Atlantis ILIO.

#### Table 3 Iometer Specifications Used for Testing

Iometer VDI Workload	Parameter
Transfer Size	4 K
Writes - Reads Ratio	80 - 20
Random - Sequential Ratio	80 - 20
Size of the Test Disk	10 GB
Number of Outstanding IOs	64

					-	•		
76 / 0 2	<b>1 문 </b>	?						
Disk Targets Network Targets Acce	ss Specifications Result	s Display   Test	Setup					
	Results Since Up	date Frequency	(seconds	]				_
Drag managers and workers from the Topology window to the progress bar of your choice.	Start of Test     C Last Update	234	 5 10	15	, 30	45	, 60	, 00
Display						_		
Total I/Os per Second	All Managers	20618.30					60000	>
	All Managers	80.54					100	, _
Total MBs per Second								>
10 December 7 (m)	All Managers	2.7722					10	
Average I/U Response Time (ms)								2
Maximum I/O Response Time (ms)	All Managers	15.8425					100	>
	All Managers	68.29 %					100 %	:
% CPU Utilization (total)								>
Total Error Count	All Managers	0					10	2
	Disk Targets Network Targets Acce Drag managers and workers from the Topology window to the progress bar of your choice. Display Total I/Os per Second Total MBs per Second Average I/O Response Time (ms) Maximum I/O Response Time (ms) % CPU Utilization (total)	Disk Targets Network Targets Access Specifications Result Drag managers and workers from the Topology window to the progress bar of your choice. Display Total I/Os per Second All Managers Total MBs per Second All Managers Average I/O Response Time (ms) Maximum I/O Response Time (ms) All Managers All Managers All Managers All Managers All Managers All Managers All Managers All Managers All Managers	Disk Targets       Network Targets       Access Specifications       Results Display       Test         Drag managers and workers from the Topology window to the progress bar of your choice.       Image: Comparison of t	Disk Targets       Network Targets       Access Specifications       Results Display       Test Setup         Drag managers and workers from the Topology window to the progress bar of your choice.       Image: Control of test       Update Frequency (seconds         Display       Image: Control of test       Image: Control of test       Image: Control of test         Display       All Managers       20618.30         Total I/Os per Second       All Managers       20722         Average I/O Response Time (ms)       All Managers       15.8425         Maximum I/O Response Time (ms)       All Managers       68.29 %         X CPU Utilization (total)       All Managers       0	Disk Targets       Network Targets       Access Specifications       Results Display       Test Setup         Drag managers and workers from the Topology window to the progress bar of your choice.       Results Since       Update Frequency (seconds)         Display       C Last Update       1 2 3 4 5 10 15         Display       All Managers       20618.30         Total I/Os per Second       All Managers       80.54         All Managers       2.7722         Average I/O Response Time (ms)       All Managers       15.8425         Maximum I/O Response Time (ms)       All Managers       68.29 %         All Managers       0       0	Image: Second       Image: Second       Image: Second       Image: Second         Disk Total MBs per Second       All Managers       20618.30         Display       All Managers       2.7722         Average I/D Response Time (ms)       All Managers       2.7722         All Managers       2.7722         All Managers       15.8425         Maximum I/D Response Time (ms)       All Managers       68.29 %         Z CPU Utilization (total)       All Managers       0	Image: Second       Image: Second       Image: Second       Image: Second       Image: Second         Disk Total MBs per Second       All Managers       20618.30       15.8425         All Managers       2.7722       Average I/O Response Time (ms)       All Managers       68.29 %         All Managers       0       0       0	Disk Targets       Network Targets       Access Specifications       Results Display       Test Setup         Drag managers and workers from the Topology window to the progress bar of your choice.       Results Since       Update Frequency (seconds)         Display       I       2       3       4       5       10       15       30       45       60         Display       All Managers       20618.30       60000       60000       60000       60000         Total I/Os per Second       All Managers       80.54       100       15       80.54       100         All Managers       80.54       100       10       100       100       100       100         Average I/O Response Time (ms)       All Managers       15.8425       100 <t< td=""></t<>

#### Figure 6 Iometer test on Atlantis ILIO

#### Login VSI

Overall desktop performance was determined by using Login VSI 3.6 with the medium no flash workload to measure response times. The Login VSI medium workload includes Word, Outlook, Excel, PowerPoint, Internet Explorer, Bullzip PDF, and 7zip. When you use the Login VSI Pro product, you can choose to test VDI deployments with a various preconfigured workloads or a custom workload.

Atlantis Computing considers Login VSI medium to be a lighter workload with fewer IOPS per desktop than a typical production VDI environment. Therefore, Atlantis Computing recommends that you create a custom workload that closely emulates the production VDI environment with the actual image that will be used in the VDI deployment.

#### Summary of the Login VSI medium workload:

- Use Outlook to browse 10 messages.
- Use Internet Explorer and leave one instance open (BBC.co.uk), and browse to one instance.
- Browse to Wired.com and Lonelyplanet.com.
- Use one instance of Word to measure response time and one instance to review and edit a document.
- Use Bullzip PDF Printer and Acrobat Reader to print the Word document to PDF.
- Use Excel to open a very large randomized sheet.
- Use PowerPoint to review and edit a presentation.
- Use the command-line version of 7-zip to zip the output of the session.

For more information, visit http://www.LoginVSI.com/workloads

#### Login VSI Test Configuration

In this test, Login VSI 3.6 Dynamic with a 30-second logon interval was used to establish the maximum density. Login VSI Dynamic works by taking a baseline of the first 15 Login VSI sessions (1,858 ms in our test). Then it uses a calculation to determine when the dynamic response time threshold is reached, which represents the maximum density that the server can support with acceptable user experience. (In this test, VSImax was not reached, which indicates that the system was not yet CPU or storage starved).

At the point where the response time hits 4000ms, Login VSI determines that you have reached the Login VSI Max or the maximum number of desktops that can be supported by on that particular server.

#### **Test Parameter Configuration**

The Microsoft Windows Base Template that is used for the testing has these characteristics:

OS	Windows 7
Format of the Virtual Machine	VMWare ESX-based virtual machine
Virtual Hard Disk Size	70 GB thick provisioned, used space 33.59 GB
RAM Used	1024 MB
CPUs	1 vCPU

Storage Utilized for Atlantis ILIO Appliance	5 GB
Storage Allocated by Atlantis ILIO for the Desktops	60 GB (accommodates 35 Windows 7 VMs)
Memory Allocated for the Appliance	10 GB
CPU Allocated	2 vCPU (1.999 GHz)

The Atlantis ILIO Virtual Appliance uses these host resources:

#### **Test Results**

The blue line in the following chart shows the average response time across all of the virtual desktops. The tested configuration supported 35 virtual desktops without reaching the VSIMax score. The response time performance was well under the threshold of 4000 ms, with an average of less than 2000 ms for the entire test run. Therefore, the maximum density for the tested architecture is more than 35 desktops when more memory is available.

The user experience stayed very consistent, even when the session density increased.



Additionally, boot time testing of a single virtual desktop showed a consistent boot time to login prompt between 15 and 20 seconds, which is faster than most physical PCs.

## Conclusion

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The Cisco Office-in-a-Box solution with VMware Horizon View delivers a branch-office desktop solution that saves OpEx, TCO, space and delivers the best user experience. By converging all IT services in a single box, the small office or retail store also saves on energy consumption and becomes simpler to manage.

# **For More Information**

Read more about Cisco Office-in-a-Box and the Cisco UCS E-Series server at www.cisco.com/go/ucse or contact your local representative.