



DEPLOYMENT
PLANNING



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BlackBox Zero Client Deployment Planning

This guide provides a detailed overview of how to plan and size the underlying infrastructure needed to support BlackBox zero client deployments. Performance results are highly dependent upon the individual host hardware, memory, storage, applications being used, OS and network conditions. Host requirements will vary, please test your multi-user environment before deployment.

Software Requirements

1) vMatrix Server Manager per shared host

The current version of vMatrix Server Manager is obtainable through the [Download Center](#) on BlackBox website.

2) Windows Operating System mounted on each shared host



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2) Windows Operating System mounted on each shared host

Supported Operation Systems by vMatrix Server Manager:

- Microsoft Windows XP SP3 Pro 32-bit (excluding Home Basic)
- Microsoft Windows 7 32-bit & 64-bit (excluding Home Basic)
- Microsoft Windows 8 32-bit & 64-bit (excluding Starter)
- Microsoft Windows 8.1 32-bit & 64-bit (excluding Starter)
- Microsoft Windows 10 32-bit & 64-bit (excluding Starter)
- Microsoft Windows Server 2003 32 bits
- Microsoft Windows Server 2008R2
- Microsoft Windows Server 2012
- Microsoft Windows Server 2012R2
- Microsoft Windows Server 2016
- Microsoft Windows Multipoint Server 2011
- Microsoft Windows Multipoint Server 2012

NOTE: do not use a 32-bit Windows operating system in your real deployment, as it supports only 3.25 GB maximum memory.



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3) Multi-User Application

vMatrix doesn't contain a component or application to allow multiple users to access the host simultaneously, to allow a simultaneous multi-user login, you need to install RDP Wrapper (download and learn more at <http://www.blackbox.net.pk/add-ons.aspx> or obtain Microsoft RDS CALs. To properly license BlackBox zero clients in a Microsoft environment, you are recommended to obtain Microsoft RDS CALs for each BlackBox seat. For more information on licensing with Microsoft operating systems see: Article 02 at <http://www.blackbox.net.pk/DefaultSupportFags.aspx>

Note: You are licensed by BlackBox to use the vMatrix Server Manager software under the terms of the EULA. You cannot use the vMatrix Server Manager software with Windows Client software (i.e., Windows XP, Windows 7, Windows 8/8.1, Windows 10) unless a single user and no other user accesses the same Windows Client software at any one time, or you are authorized to do so under an applicable license from Microsoft. In all cases, your rights and obligations with respect to the use of vMatrix Server Manager software with Windows Server software and Windows Client software are defined by both the BlackBox vMatrix Server Manager software EULA and the applicable Microsoft Software License Agreement or EULA.

Hardware Requirements

1) Preliminary Guideline

The preliminary guideline below provides an estimated starting point from which administrators can test and, if needed, adjust the hardware specifications of their chosen host systems. BlackBox recommends you always test your environment in advance of deployment to ensure it meets your expectations.

CPU

2.5 users per thread/core of a 3.6GHz, 22nm, 1150 pin CPU (e.g.: i7-4790)

Memory

1GB per task user running office, browser, messenger, video on VLC player, etc.
1.5GB per designer running Photoshop, Illustrator, Auto-CAD, etc.

Storage

SSD for system and program files + HDD for user data; Storage size to be determined by actual needs.

Network

Average 15Mbps per user within LAN (a single users may consume up to 30Mbps).

Note: the above preliminary shows average resource usage by users simultaneously working under desktop resolution of 1366*768; keep in mind that resource usage will vary depending on the desktop resolution and the average usage habit of those users.

2) Practical Recommendations

Host Configurations (5-60 Users):

While the vMatrix Server Manager itself can support up to 99 S100 zero client connections, the host specifications required to provide an optimal user experience will vary by the number of users connecting to a given host and the average usage habits of those users. Performance results are highly dependent upon the individual host hardware, memory, applications being used, OS and network conditions within any LAN. The recommendations below cover best practices for estimating host hardware requirements to support 5 to 60 users on a single host unit. You can use more than one host units for deployments over 60 users. Contact us if you need help in supporting other number of users on a single host unit.

5 Users

Baseline:

Components	Requirements
CPU	Intel i5-4460 or equivalent that supports 6 (10) G Max. memory.
Memory	6G (for task users) or 10G (for designers); Compatible with CPU (DDR3).
Storage	7200rpm hard drive (storage size to be determined by actual needs).
Mainboard	Compatible with CPU and memory (LGA1150; DDR3, 6/10G or above Max. memory support); Gigabyte onboard LAN controller.



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Components	Requirements
CPU Cooler	Efficient cooling (separate purchase); Compatible with CPU (LGA1150).
Power	350W.
Case	Compatible with mainboard.

Examples: For task users running office, browser, messenger, video on VLC player, etc.

Components	Recommendations	QTY	Ref. Price
CPU	Intel Core i5-4460 (4 cores, 4 threads, 3.2GHz, 22nm,1150 pin)	1	US\$208
Mainboard	GIGABYTE B85-HD3 (Intel B85, LGA1150)	1	US\$92
Memory	Kingston Hyper Fury DDR3 1600MHz 4GB	2	US\$46
HDD	Seagate ST1000DM003 (1TB, 7200RPM, 64M, SATA3)	1	US\$49
Case	SAMA Golden field	1	US\$35
Power	SAMA Gold 80plus 500W	1	US\$45
CPU Cooler	DEEPCOOL GAMMAXX 400 (air cooling, heat pipe)	1	US\$15
US\$490			



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5 USERS

Example:

For Designers Running Photoshop, Illustrator, AutoCAD, etc.

Components	Recommendations	QTY	Ref. Price
CPU	Intel Core i5-4460 (4 cores, 4 threads, 3.2GHz, 22nm,1150 pin)	1	US\$208
Mainboard	GIGABYTE B85-HD3 (Intel B85, LGA1150)	1	US\$92
Memory	Kingston Hyper Fury DDR3 1600MHz 8GB	2	US\$69
HDD	Seagate ST1000DM003 (1TB, 7200RPM, 64M, SATA3)	1	US\$49
Case	SAMA Golden Field	1	US\$35
Power	SAMA 80plus Gold 500W	1	US\$45
CPU Cooler	DEEPCOOL GAMMAXX 400 (air cooling, heat pipe)	1	US\$15
US\$513			



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10 USERS

Baseline:

Components	Requirements
CPU	Intel i5-4690K or equivalent that supports 12 (16)G Max. memory.
Memory	12G (for task users) or 16G (for designers); Compatible with CPU (DDR3).
HDD	SSD plus HDD (storage size to be determined by actual needs).
Mainboard	Compatible with CPU and memory (LGA1150; DDR3, 12/16G or above Max. memory support); Gigabyte onboard LAN controller.
Case	SAMA Golden Field
Power	SAMA 80plus Gold 500W
CPU Cooler	DEEPCOOL GAMMAXX 400 (air cooling, heat pipe)



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10 USERS

Example 1:

For task users running office, browser, messenger, video on VLC player, etc.

Components	Recommendations	QTY	Ref. Price
CPU	Intel Core i5-4690k (4 cores, 4 threads, 3.5GHz, 22nm,1150 pin)	1	US\$254
Mainboard	GIGABYTE G1.Sniper H6 (Intel H97, LGA1150)	1	US\$123
Memory	Kingston Hyper Fury DDR3 1600MHz 4GB	3	US\$69
HDD	Seagate ST1000DM003 (1TB, 7200RPM, 64M, SATA3)	1	US\$49
SSD	ADATA ASP550SS-120GM-C (120G, 2.5 inches, SATA3)	1	US\$41
Case	SAMA Golden field		US\$35
Power	SAMA Gold 80plus 500W	1	US\$45
CPU Cooler	DEEPCOOL GAMMAXX 400 (air cooling, heat pipe)	1	US\$15
US\$631			



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10 USERS

Example 2:

For Designers Running Photoshop, Illustrator, AutoCAD, etc.

Components	Recommendations	QTY	Ref. Price
CPU	Intel Core i5-4690k (4 cores, 4 threads, 3.5GHz, 22nm,1150 pin)	1	US\$254
Mainboard	GIGABYTE G1.Sniper H6 (Intel H97, LGA1150)	1	US\$123
Memory	Kingston Hyper Fury DDR3 1600MHz 8GB	2	US\$77
HDD	Seagate ST1000DM003 (1TB, 7200RPM, 64M, SATA3)	1	US\$49
SSD	ADATA ASP550SS-120GM-C (120G, 2.5 inches, SATA3)	1	US\$41
Case	SAMA Golden field		US\$35
Power	SAMA Gold 80plus 500W	1	US\$45
CPU Cooler	DEEPCOOL GAMMAXX 400 (air cooling, heat pipe)	1	US\$15
US\$639			



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15 USERS

Baseline:

Components	Requirements
CPU	Intel i5-6600K or equivalent that supports 16 (24)G Max. memory.
Memory	16G (for task users) or 24G (for designers); Compatible with CPU (DDR4).
HDD	SSD plus HDD (storage size to be determined by actual needs).
Mainboard	Compatible with CPU and memory (LGA1151; DDR4, 16/24G or above Max. memory support); Gigabyte onboard LAN controller.
Case	Compatible with mainboard.
Power	400W
CPU Cooler	Efficient cooling (separate purchase); Compatible with CPU (LGA1151).



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15 USERS

Example 1:

For task users running office, browser, messenger, video on VLC player, etc.

Components	Recommendations	QTY	Ref. Price
CPU	Intel Core i5-6600k (4 cores, 4 threads, 3.5GHz, 14nm, 1151 pin)	1	US\$258
Mainboard	ASUS Z170M-PLUS (Intel Z170, LGA 1151)	1	US\$154
Memory	Kingston Hyper Fury DDR4 2133MHz 8GB	2	US\$92
HDD	Seagate ST1000DM003 (1TB, 7200RPM, 64M, SATA3)	1	US\$49
SSD	ADATA ASP550SS-120GM-C (120G, 2.5 inches, SATA3)	1	US\$41
Case	SAMA Golden field		US\$35
Power	SAMA Gold 80plus 500W	1	US\$44
CPU Cooler	DEEPCOOL GAMMAXX 400 (air cooling, heat pipe)	1	US\$15
			US\$689



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15 USERS

Example 2:

For Designers Running Photoshop, Illustrator, AutoCAD, etc.

Components	Recommendations	QTY	Ref. Price
CPU	Intel Core i5-6600k (4 cores, 4 threads, 3.5GHz, 14nm, 1151 pin)	1	US\$258
Mainboard	ASUS ZI70M-PLUS (Intel ZI70, LGA 1151)	1	US\$154
Memory	Kingston Hyper Fury DDR4 2133MHz 8GB	3	US\$138
HDD	Seagate ST1000DM003 (1TB, 7200RPM, 64M, SATA3)	1	US\$49
SSD	ADATA ASP550SS-120GM-C (120G, 2.5 inches, SATA3)	1	US\$41
Case	SAMA Golden field		US\$35
Power	SAMA Gold 80plus 500W	1	US\$44
CPU Cooler	DEEPCOOL GAMMAXX 400 (air cooling, heat pipe)	1	US\$15
US\$735			



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20 USERS

Baseline:

Components	Requirements
CPU	Intel i7-4770K or equivalent that supports 22 (32)G Max. memory.
Memory	22G (for task users) or 32G (for designers); Compatible with CPU (DDR3).
HDD	SSD plus HDD (storage size to be determined by actual needs).
Mainboard	Compatible with CPU and memory (LGA1150; DDR3, 22/32G or above Max. memory support); Gigabyte onboard LAN controller.
Case	Compatible with mainboard.
Power	450W
CPU Cooler	Efficient cooling (separate purchase); Compatible with CPU (LGA1150).



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20 USERS

Example 1:

For task users running office, browser, messenger, video on VLC player, etc.

Components	Recommendations	QTY	Ref. Price
CPU	Intel Core i7-4790 (4 cores, 8 threads, 3.6GHz, 22nm, L1150 pin)	1	US\$330
Mainboard	ASUS Z97 (Intel Z97, LGA 1150)	1	US\$138
Memory	Kingston Hyper Fury DDR3 1600MHz 8GB	3	US\$115
HDD	Seagate ST2000DM001 (2TB, 7200RPM, 64M, SATA3)	1	US\$69
SSD	ADATA ASP550SS-240GM-C (240G, 2.5 inches, SATA3)	1	US\$58
Case	SAMA Golden field		US\$35
Power	SAMA Gold 80plus 500W	1	US\$44
CPU Cooler	DEEPCOOL GAMMAXX 400 (air cooling, heat pipe)	1	US\$15
			US\$805



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20 USERS

Example 2:

For Designers Running Photoshop, Illustrator, AutoCAD, etc.

Components	Recommendations	QTY	Ref. Price
CPU	Intel Core i7-4790 (4 cores, 8 threads, 3.6GHz, 22nm, L1150 pin)	1	US\$330
Mainboard	ASUS Z97 (Intel Z97, LGA 1150)	1	US\$138
Memory	Kingston Hyper Fury DDR3 1600MHz 8GB	4	US\$153
HDD	Seagate ST2000DM001 (2TB, 7200RPM, 64M, SATA3)	1	US\$69
SSD	ADATA ASP550SS-240GM-C (240G, 2.5 inches, SATA3)	1	US\$58
Case	SAMA Golden field		US\$35
Power	SAMA Gold 80plus 500W	1	US\$44
CPU Cooler	DEEPCOOL GAMMAXX 400 (air cooling, heat pipe)	1	US\$15
US\$843			



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25 USERS

Baseline:

Components	Requirements
CPU	Intel i7-4770K or equivalent that supports 26 (38)G Max. memory.
Memory	26G (for task users) or 38G (for designers); Compatible with CPU (DDR3).
HDD	SSD plus HDD (storage size to be determined by actual needs).
Mainboard	Compatible with CPU and memory (LGA1150; DDR3, 26/38G or above Max. memory support); Gigabyte onboard LAN controller.
Case	Compatible with mainboard.
Power	450W
CPU Cooler	Efficient cooling; Compatible with CPU (LGA1150, separate purchase).



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25 USERS

Example 1 (General Performance):

For task users running office, browser, messenger, video on VLC player, etc.

Components	Recommendations	QTY	Ref. Price
CPU	Intel Core i7-4790 (4 cores, 8 threads, 3.6GHz, 22nm, L1150 pin)	1	US\$330
Mainboard	ASUS Z97 (Intel Z97, LGA 1150)	1	US\$138
Memory	Kingston Hyper Fury DDR3 1600MHz 8GB	4	US\$153
HDD	Seagate ST2000DM001 (2TB, 7200RPM, 64M, SATA3)	1	US\$69
SSD	ADATA ASP550SS-240GM-C (240G, 2.5 inches, SATA3)	1	US\$58
Case	SAMA Golden field		US\$35
Power	SAMA Gold 80plus 500W	1	US\$44
CPU Cooler	DEEPCOOL GAMMAXX 400 (air cooling, heat pipe)	1	US\$15
			US\$843



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25 USERS

Example 2 (High Performance):

For task users running office, browser, messenger, video on VLC player, etc.

Components	Recommendations	QTY	Ref. Price
CPU	Intel Core i7-6700K (4 cores, 8 threads, 4.0GHz, 14nm,1151 pin)	1	US\$415
Mainboard	GIGABYTE Z170-HD3 (Intel Z170/LGA 1151)	1	US\$138
Memory	Kingston Hyper Fury DDR4 2133MHz 8GB	4	US\$184
RAID Card	SYBA FG-EST17A (RAID 0 1 10 & HyperDuo)	1	US\$45
HDD	Seagate ST1000DM003 (1TB, 7200RPM, 64M, SATA3) in RAID 0	1	US\$98
SSD	ADATA ASP550SS-240GM-C (240G, 2.5 inches, SATA3)	1	US\$58
Case	SAMA Golden field		US\$35
Power	SAMA Gold 80plus 500W	1	US\$44
CPU Cooler	DEEPCOOL GAMMAXX 400 (air cooling, heat pipe)	1	US\$15
US\$1,033			



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25 USERS

Example 3:

For Designers Running Photoshop, Illustrator, AutoCAD, etc.

Components	Recommendations	QTY	Ref. Price
CPU	Intel Core i7-5820K (6 cores, 12 threads, 3.3GHz, 22nm, 2011 pin)	1	US\$437
Mainboard	MSI X99A SLI PLUS (Intel X99, LGA 2011-v3)	1	US\$369
Memory	Kingston Hyper Fury DDR4 2133MHz 8GB	4	US\$230
RAID Card	SYBA FG-EST17A (RAID 0 1 10 & HyperDuo)	1	US\$45
HDD	Seagate ST1000DM003 (1TB, 7200RPM, 64M, SATA3) in RAID 0	1	US\$98
SSD	ADATA ASP550SS-240GM-C (240G, 2.5 inches, SATA3)	1	US\$58
Case	SAMA Golden field		US\$35
Power	SAMA Gold 80plus 500W	1	US\$44
CPU Cooler	CoolerMaster T4 (air cooling, heat pipe)	1	US\$18
			US\$1,335



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30 USERS

Baseline:

Components	Requirements
CPU	Intel i7-5820K or equivalent that supports 32 (48)G Max. memory.
Memory	32G (for task users) or 48G (for designers); Compatible with CPU (DDR4).
Storage	SSD plus HDD in RAID (storage size to be determined by actual needs).
Mainboard	Compatible with CPU and memory (LGA2011-v3; DDR4, 32/48G or above Max. memory support); Gigabyte onboard LAN controller.
Case	Compatible with mainboard.
Power	500W
CPU Cooler	Efficient cooling (separate purchase); Compatible with CPU (LGA2011-v3).



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30 USERS

Example 1 (General Performance):

For task users running office, browser, messenger, video on VLC player, etc.

Components	Recommendations	QTY	Ref. Price
CPU	Intel Core i7-5820K (6 cores, 12 threads, 3.3GHz, 22nm, 2011 pin)	1	US\$437
Mainboard	ASRock X99 Extreme3 (Intel X99, LGA 2011-v3)	1	US\$261
Memory	Kingston Hyper Fury DDR4 2133MHz 8GB	4	US\$184
RAID Card	SYBA FG-EST17A (RAID 0 10 & HyperDuo)	1	US\$45
HDD	Seagate ST1000DM003 (1TB, 7200RPM, 64M, SATA3) in RAID 0	1	US\$98
SSD	ADATA ASP550SS-240GM-C (240G, 2.5 inches, SATA3)	1	US\$58
Case	SAMA Golden field		US\$35
Power	SAMA Gold 80plus 500W	1	US\$44
CPU Cooler	CoolerMaster T4 (air cooling, heat pipe)	1	US\$18
US\$1,181			



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30 USERS

Example 2 (High Performance):

For task users running office, browser, messenger, video on VLC player, etc.

Components	Recommendations	QTY	Ref. Price
Server	Dell PowerEdge R430	1	US \$3,034
CPU	Intel Xeon E5-2620 v3 (6 cores, 12 threads, 2.4GHz, 22nm, 2011 pin)	2	
Memory	DDR4 2133MHz 8GB ECC	4	
RAID Card	PERC H330 (RAID 0 5 10 & 50)	1	
HDD	Enterprise (1TB, 7200RPM, 128M, SATA3) in RAID 0	1	
SSD	Enterprise (240G, 2.5 inches, SATA3)	1	
US\$3,034			



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30 USERS

Example 3 (For Graphics):

For Designers Running Photoshop, Illustrator, AutoCAD, etc.

Components	Recommendations	QTY	Ref. Price
CPU	Intel Core i7-5820K (6 cores, 12 threads, 3.3GHz, 22nm, 2011 pin)	1	US\$437
Mainboard	ASRock X99 Extreme3 (Intel X99, LGA 2011-v3)	1	US\$369
Memory	Kingston Hyper Fury DDR4 2133MHz 8GB	6	US\$276
RAID Card	SYBA FG-EST17A (RAID 0 10 & HyperDuo)	1	US\$45
HDD	Seagate ST1000DM003 (1TB, 7200RPM, 64M, SATA3) in RAID 0	1	US\$98
SSD	ADATA ASP550SS-240GM-C (240G, 2.5 inches, SATA3)	1	US\$58
Case	SAMA Golden field		US\$35
Power	SAMA Gold 80plus 500W	1	US\$44
CPU Cooler	CoolerMaster T4 (air cooling, heat pipe)	1	US\$18
US\$1,381			



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30 USERS

Example 4 (High Performance for Graphics):

For Designers Running Photoshop, Illustrator, AutoCAD, etc.

Components	Recommendations	QTY	Ref. Price
Server	Dell PowerEdge R430	1	US \$3,233
CPU	Intel Xeon E5-2620 v3 (6 cores, 12 threads, 2.4GHz, 22nm, 2011 pin)	2	
Memory	DDR4 2133MHz 8GB ECC	6	
RAID Card	PERC H330 (RAID 0 5 10 & 50)	1	
HDD	Enterprise (1TB, 7200RPM, 128M, SATA3) in RAID 0	2	
SSD	Enterprise (240G, 2.5 inches, SATA3)	1	
US\$3,233			



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40 USERS

Baseline:

Components	Requirements
CPU	Intel E5-2630 v3 *2 or equivalent that supports 42 (62)G Max. memory.
Memory	42G (for task users) or 62G (for designers); Compatible with CPU (DDR4).
Storage	SSD plus HDD in RAID (storage size to be determined by actual needs).
Mainboard	Compatible with CPU and memory (Socket 2011 - v3; DDR4, 42/62G or above Max. memory support); Gigabyte onboard LAN controller.
Case	Compatible with mainboard.
Power	500W
CPU Cooler	Efficient cooling; Compatible with CPU (Socket 2011 - v3).



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40 USERS

Example 1 :

For task users running office, browser, messenger, video on VLC player, etc.

Components	Recommendations	QTY	Ref. Price
Server	Dell PowerEdge R430	1	US \$3,992
CPU	Intel Xeon E5-2630 v3 (8 cores, 16 threads, 2.3GHz, 22nm, 2011-3 pin)	2	
Memory	DDR4 2133MHz 8GB ECC	6	
RAID Card	PERC H330 (RAID 0 5 10 & 50)	1	
HDD	Enterprise (1TB, 7200RPM, 128M, SATA3) in RAID 0	3	
SSD	Enterprise (480G, 2.5 inches, SATA3)	1	
US\$3,992			



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40 USERS

Example 2 (For Graphics):

For Designers Running Photoshop, Illustrator, AutoCAD, etc.

Components	Recommendations	QTY	Ref. Price
Server	Dell PowerEdge R430	1	US \$4,195
CPU	Intel Xeon E5-2630 v3 (8 cores, 16 threads, 2.3GHz, 22nm, 2011-3 pin)	2	
Memory	DDR4 2133MHz 8GB ECC	8	
RAID Card	PERC H330 (RAID 0 5 10 & 50)	1	
HDD	Enterprise (1TB, 7200RPM, 128M, SATA3) in RAID 0	3	
SSD	Enterprise (480G, 2.5 inches, SATA3)	1	
US\$4,195			



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50 USERS

Baseline:

Components	Requirements
CPU	Intel E5-2640 v3 *2 or equivalent that supports 52 (76)G Max. memory.
Memory	52G (for task users) or 76G (for designers); Compatible with CPU (DDR4).
Storage	SSD plus HDD in RAID (storage size to be determined by actual needs).
Mainboard	Compatible with CPU and memory (Socket 2011 - v3; DDR4, 52/76G or above Max. memory support); Gigabyte onboard LAN controller.
Case	Compatible with mainboard.
Power	550W
CPU Cooler	Efficient cooling; Compatible with CPU (Socket 2011 - v3).



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50 USERS

Example 1 :

For task users running office, browser, messenger, video on VLC player, etc.

Components	Recommendations	QTY	Ref. Price
Server	Dell PowerEdge R430	1	US \$5,412
CPU	Intel Xeon E5-2640 v3 (8 cores, 16 threads, 2.6GHz, 22nm, 2011-3 pin)	2	
Memory	DDR4 2133MHz 8GB ECC	7	
RAID Card	PERC H330 (RAID 0 5 10 & 50)	1	
HDD	Enterprise (1TB, 7200RPM, 128M, SATA3) in RAID 0	3	
SSD	Enterprise (480G, 2.5 inches, SATA3)	1	
US\$5,412			



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50 USERS

Example 2 (For Graphics):

For Designers Running Photoshop, Illustrator, AutoCAD, etc.

Components	Recommendations	QTY	Ref. Price
Server	Dell PowerEdge R430	1	US \$5,417
CPU	Intel Xeon E5-2640 v3 (8 cores, 16 threads, 2.6GHz, 22nm, 2011-3 pin)	2	
Memory	DDR4 2133MHz 8GB ECC	10	
RAID Card	PERC H330 (RAID 0 5 10 & 50)	1	
HDD	Enterprise (1TB, 7200RPM, 128M, SATA3) in RAID 0	3	
SSD	Enterprise (480G, 2.5 inches, SATA3)	1	
US\$5,417			



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60 USERS

Baseline:

Components	Requirements
CPU	Intel E5-2660 v3 *2 or equivalent that supports 62 (92)G Max. memory.
Memory	62G (for task users) or 92G (for designers); Compatible with CPU (DDR4).
Storage	SSD plus HDD in RAID (storage size to be determined by actual needs).
Mainboard	Compatible with CPU and memory (Socket 2011 - v3; DDR4, 62/92G or above Max. memory support); Gigabyte onboard LAN controller.
Case	Compatible with mainboard.
Power	550W
CPU Cooler	Efficient cooling; Compatible with CPU (Socket 2011 - v3).

60 USERS

Example 1 :

For task users running office, browser, messenger, video on VLC player, etc.

Components	Recommendations	QTY	Ref. Price
Server	Dell PowerEdge R430	1	US \$6,363
CPU	Intel Xeon E5-2660 v3 (10 cores, 20 threads, 2.6GHz, 22nm, 2011-3 pin)	2	
Memory	DDR4 2133MHz 16GB ECC	4	
RAID Card	PERC H330 (RAID 0 5 10 & 50)	1	
HDD	Enterprise (1TB, 7200RPM, 128M, SATA3) in RAID 0	4	
SSD	Enterprise (480G, 2.5 inches, SATA3)	1	
US\$6,363			



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60 USERS

Example 2 (For Graphics):

For Designers Running Photoshop, Illustrator, AutoCAD, etc.

Components	Recommendations	QTY	Ref. Price
Server	Dell PowerEdge R430	1	US \$6,769
CPU	Intel Xeon E5-2660 v3 (10 cores, 20 threads, 2.6GHz, 22nm, 2011-3 pin)	2	
Memory	DDR4 2133MHz 8GB ECC	6	
RAID Card	PERC H330 (RAID 0 5 10 & 50)	1	
HDD	Enterprise (1TB, 7200RPM, 128M, SATA3) in RAID 0	4	
SSD	Enterprise (480G, 2.5 inches, SATA3)	1	
US\$6,769			

The above costs are based on public retail pricing in China market on this guide's creation date. Currency exchange rate used is 1 USD= 6.5 RMB.



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Tips

1. CPU: When you are configuring hosts for the number of users, CPU selection should be given the highest priority and then choose other components compatible with the CPU and the others. View CPU Benchmark in the section below for CPU selection.
2. CPU cooler: If you choose assembly desktop PCs, use separate CPU cooler priced over US\$13 as most free CPU cooler that comes in bundle with the CPU is not efficient and durable.

Note:

resource usage testing was performed under the following conditions, keep in mind that resource usage will vary with these conditions changing. Actual sizing requirements depend on particular workload. Always validate sizing using your own applications.

- 1) Operation system: Windows Server 2012 R2;
- 2) Client desktop resolution: 1366*768;
- 3) vMatrix Server Manager version: 2.0.3;
- 4) Client Firmware version: 2.0.0.10;
- 5) Tested applications was run by the corresponding number of simultaneous working users on
- 6) Video testing was performed using VLC player 2.15 with rendering done on zero clients.



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Networking Hardware

	Switch	10/100/1000Mbps Base-T
Cable	Connecting zero clients	10/100Mbps or 10/100/1000Mbps Base-T
	Connecting hosts/ switches	10/100/1000/Mbps Base-T

Note:

- 1) For deployments over 60 users on a single host unit, the host network controller, the switch connecting to host (primary switch), the cables connecting to host and primary switch should support 10/100/1000/10000Mbps Base-T.
- 2) Some switches in the market are not qualified to be 10/100/1000Mbps Base-T supported as their manufacturers claim. BlackBox recommends you always test transmission speed of the switches in advance of deployment to ensure it meets your expectations.
- 3) Although BlackBox zero clients have a WIFI option, you are recommended to use standard Ethernet network as unreliable WIFI network may cause disconnection or experience compromised.
- 4) Most of the Wide Area Networks (WAN) have excessive latency and lower bandwidth. This compromises with the rich PC-like experience over the network.

For more information on networking configuration, visit our website.

<http://www.blackbox.net.pk> or contact our marketing / support team.