

HOW TO LEGOFY YOUR INFRASTRUCTURE

SINISA SOKOLIC - E2EVC LISBON 2015

ABOUT_ME



@sinisasokolic

www.sinisasokolic.com

CTO @ RISC

16 Years Experience in the field

Mainly Citrix XenApp and XenDesktop





AGENDA

- LEARNING FROM OTHERS
- CHALLENGES
- DEFINING BRICKS
- LEGOFY SOMETHING
- CONFIGURATION AUTOMATION

ABOUT_OTHERS

- ❖ AUTOMOTIVE SECTOR
- ❖ MODULAR TRANSVERSE TOOLKIT
- ❖ 60% IDENTICAL PARTS IN 3, 4 AND 6 CYLINDER MODELS
- ❖ SAME PARTS IN BMW SERIES 1, 3, 5 AND MINI
- ❖ BUILDING BLOCKS LEAD TO COST REDUCTION



Das Auto.

LEG
AS LONG



LEO DAS AUTO. KS,
IF YOU SCREW THINGS UP.

OD,
T RIGHT.

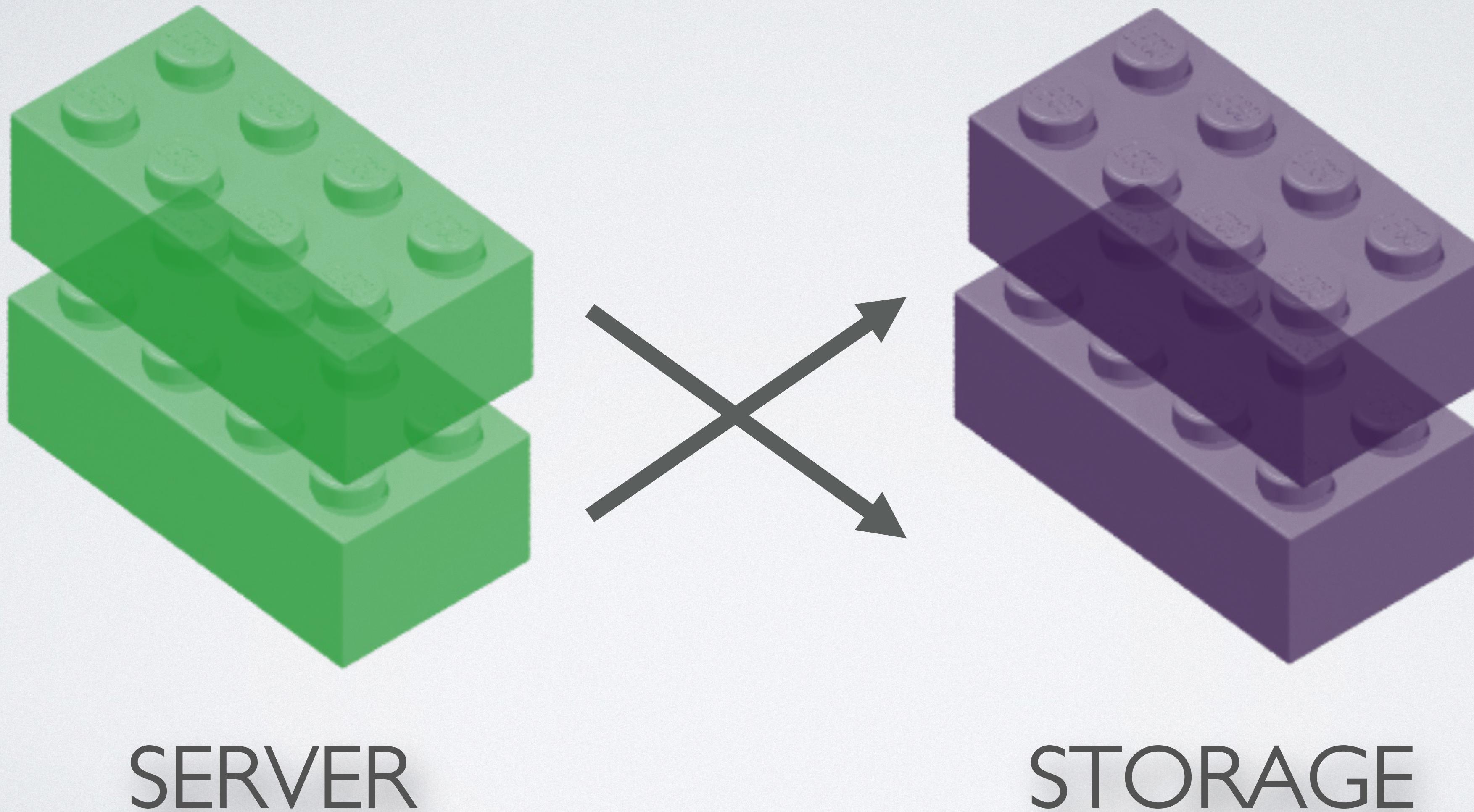


YOUR INFRASTRUCTURE?

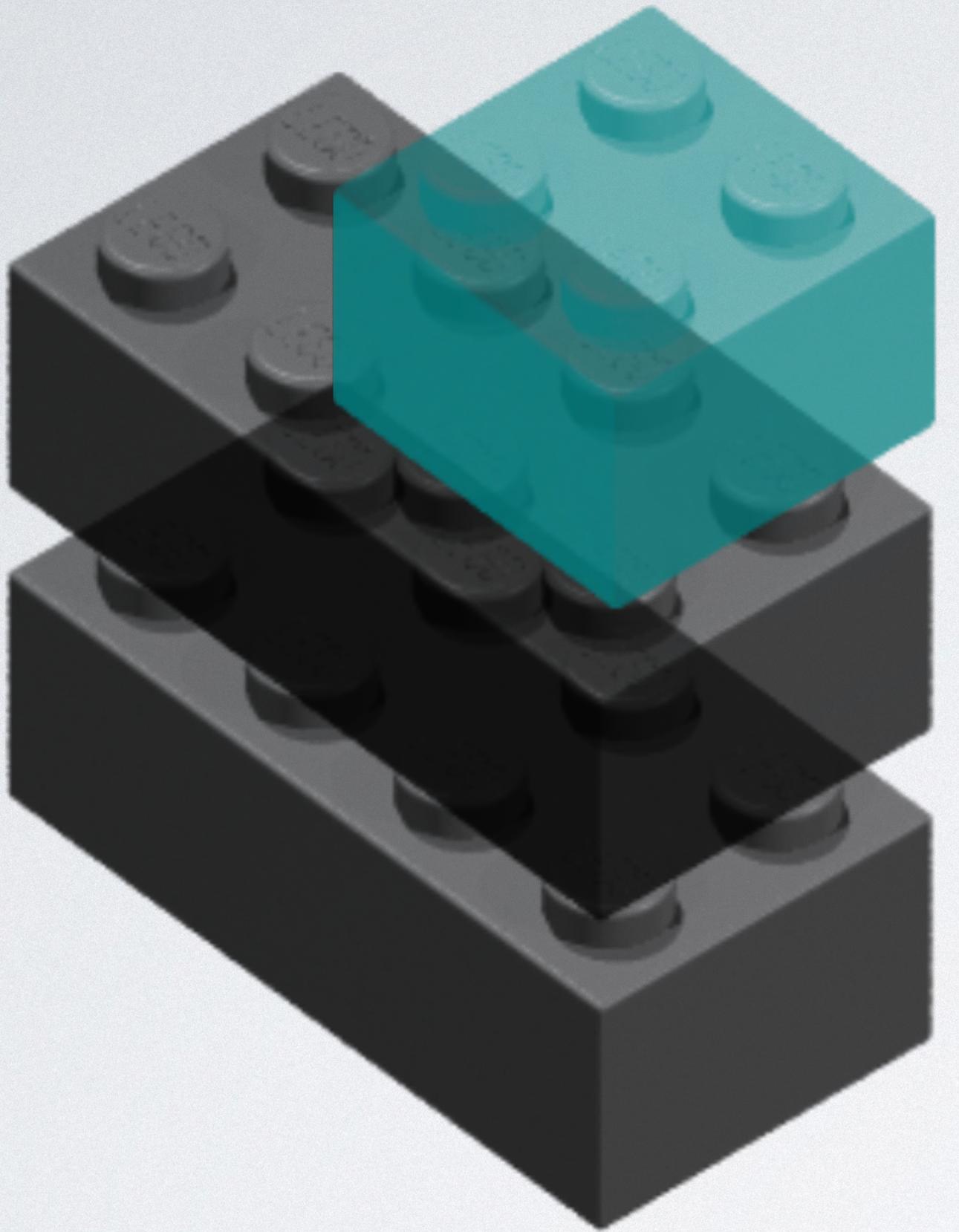
ABOUT_CHALLENGES

- ❖ IT IS MORE AND MORE CENTER OF COMPANY DEVELOPMENT
- ❖ LEADERSHIP ROLE OF IT
- ❖ COST EFFICIENCY
- ❖ COMPLEXITY REDUCTION OF THE WHOLE STACK
- ❖ TIME TO MARKET
- ❖ ... SECURITY, RELIABILITY, AVAILABILITY AND AGILITY

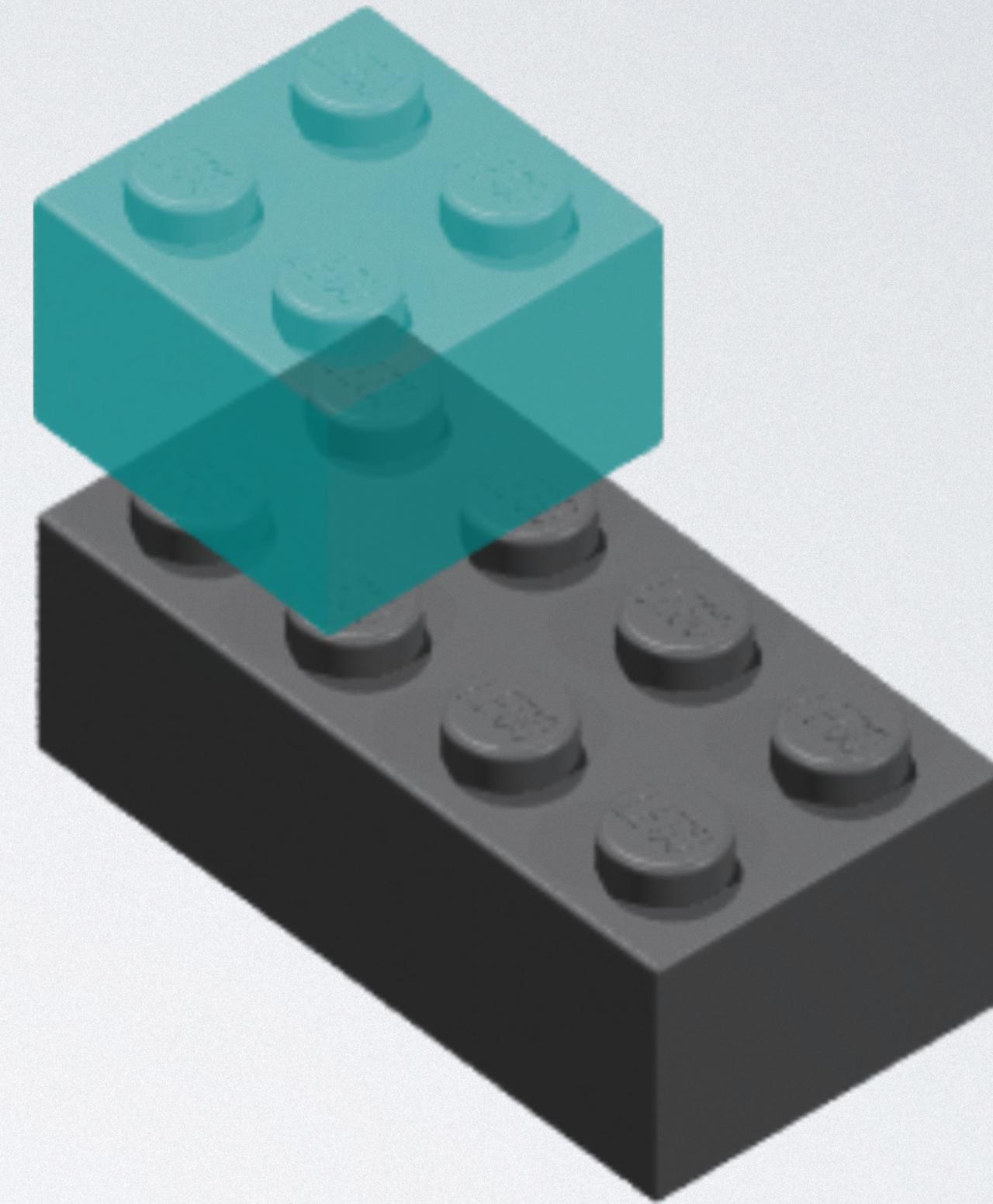
ABOUT_OLD SCHOOL



ABOUT_NEWSCHOOL



HYPER-
CONVERGED



CLOUD

ABOUT_INFRASTRUCTURE

- ❖ OLDSCHOOL VS. NEWSCHOOL
- ❖ USE THE CLOUD TO GET RID OF THE HARDWARE STACK
- ❖ USE HYPERCONVERGED TO SIMPLIFY HARDWARE DEPLOYMENT

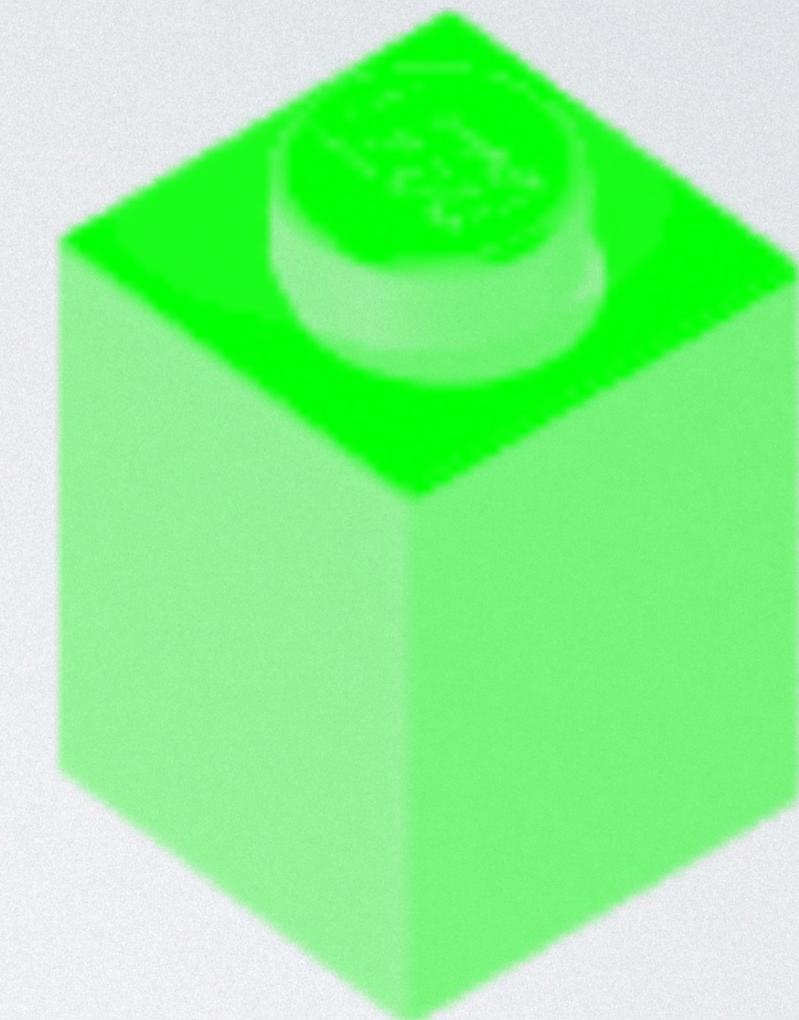
ABOUT_AUTOMATION

- WHERE ARE GAPS?
- HARDWARE IMPLEMENTATION > USE THE CLOUD
- HUMANS
- MODULARIZATION IS KEY TO SUCCESS
- NO CLOUD WITHOUT AUTOMATION
- PARAMETERIZE WHEREVER POSSIBLE

DEFINING BRICKS



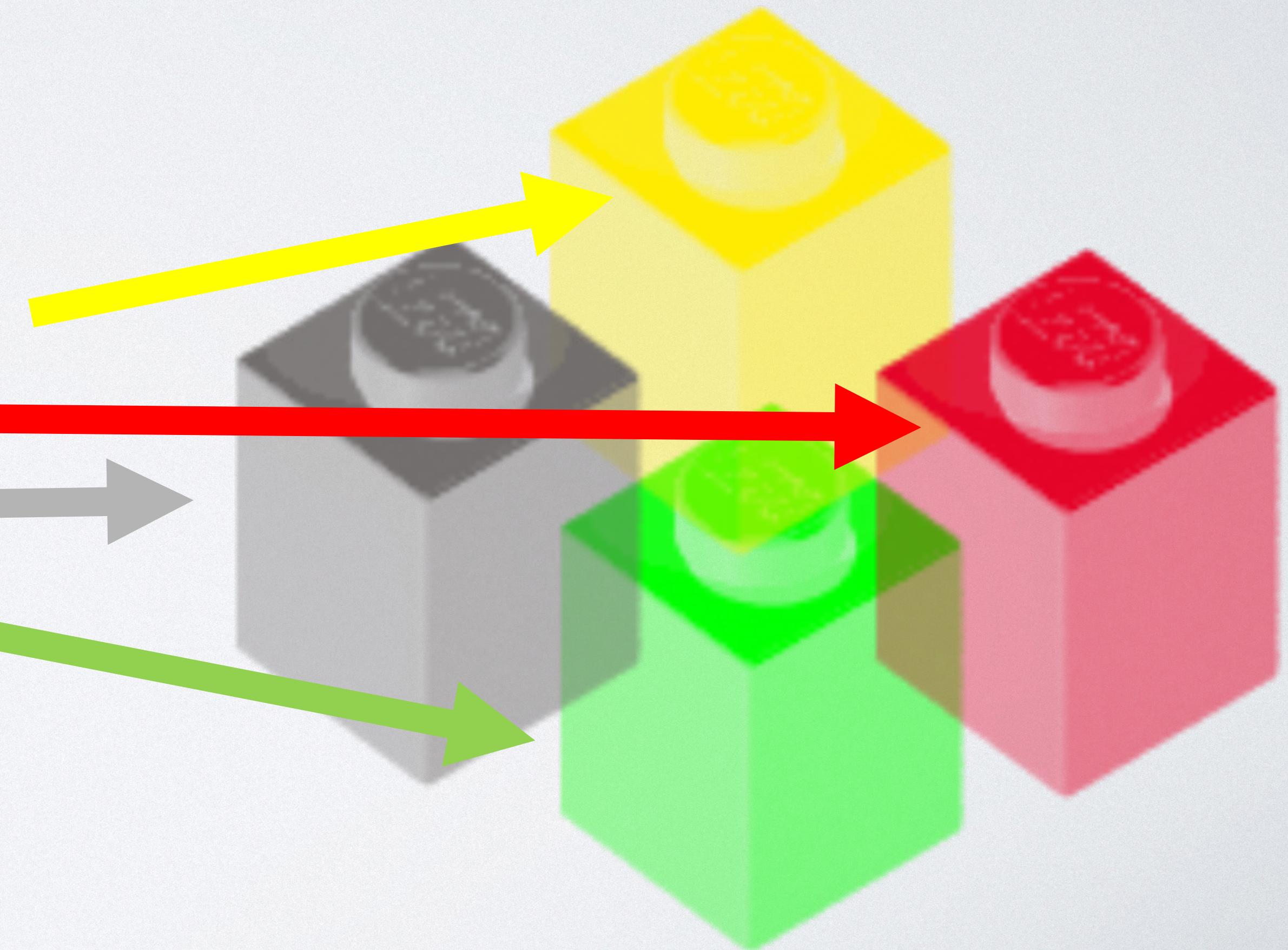
```
1 # Install Citrix GroupPolicyManagement 2.5.0.0
2 # https://www.citrix.com/downloads/xendesktop/product-software/xendesktop-76-feature-pack-3-platinum.html
3 Write-Host "Installing Citrix GroupPolicyManagement 2.5.0.0" -ForegroundColor Green
4 start-process -Filepath "$labsources\XenDesktop_76\Controller\CitrixGroupPolicyManagement_7.6.300\CitrixGroupPolicyManagement_x64.msi" -ArgumentList "/quiet" -Wait|
```

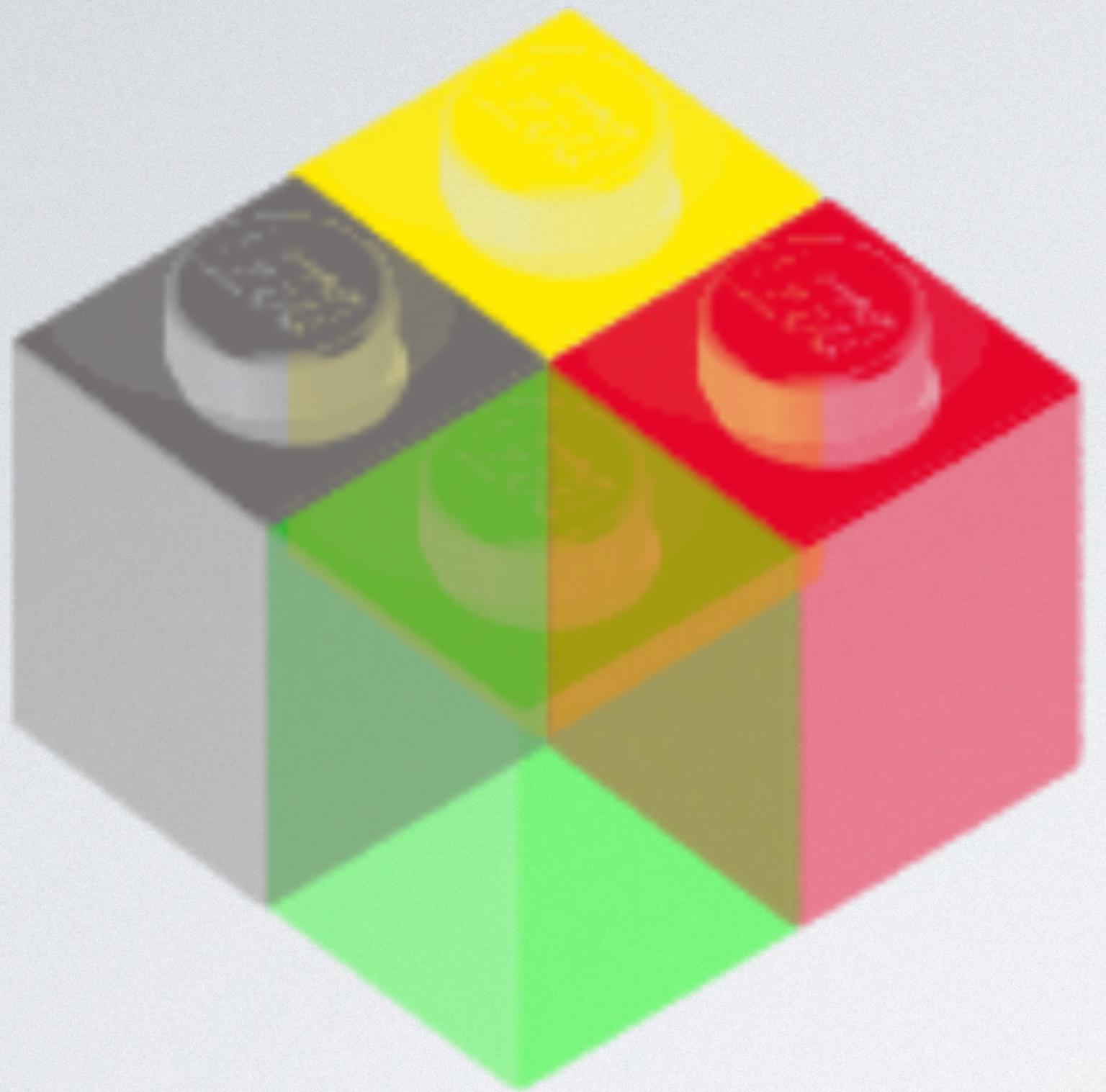


Start-process –Filepath
“\$labsources\CitrixGroupPolicyManagement_x64.msi” –ArgumentList
“/quiet” -Wait

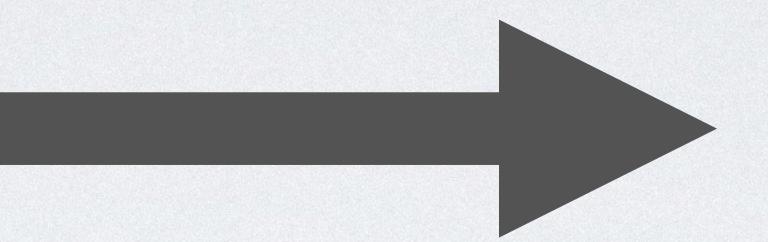
```
1 write-Host "Installing Microsoft Windows Remote Desktop Services Session Host" -ForegroundColor Green  
2  
3 Write-Host "Installing Roles and Features" -ForegroundColor DarkGreen  
4 # Windows-Feature Desktop Experience  
5 Write-Host "Installing Desktop-Experience" -ForegroundColor DarkGreen  
6 Add-WindowsFeature Desktop-Experience  
7  
8 # Windows-Feature Remote Desktop Services Host  
9 Write-Host "Installing RDS-RD-Server" -ForegroundColor DarkGreen  
10 Add-WindowsFeature RDS-RD-Server  
11  
12 # Windows-Feature Remote Assistance  
13 Write-Host "Installing Remote-Assistance" -ForegroundColor DarkGreen  
14 Add-WindowsFeature Remote-Assistance  
15  
16 # Windows-Feature XPS Viewer  
17 Write-Host "Installing XPS-Viewer" -ForegroundColor DarkGreen  
18 Add-WindowsFeature XPS-Viewer
```

Add-WindowsFeature Desktop-Experience
Add-WindowsFeature RDS-RD-Server
Add-WindowsFeature Remote-Assistance
Add-WindowsFeature XPS-Viewer



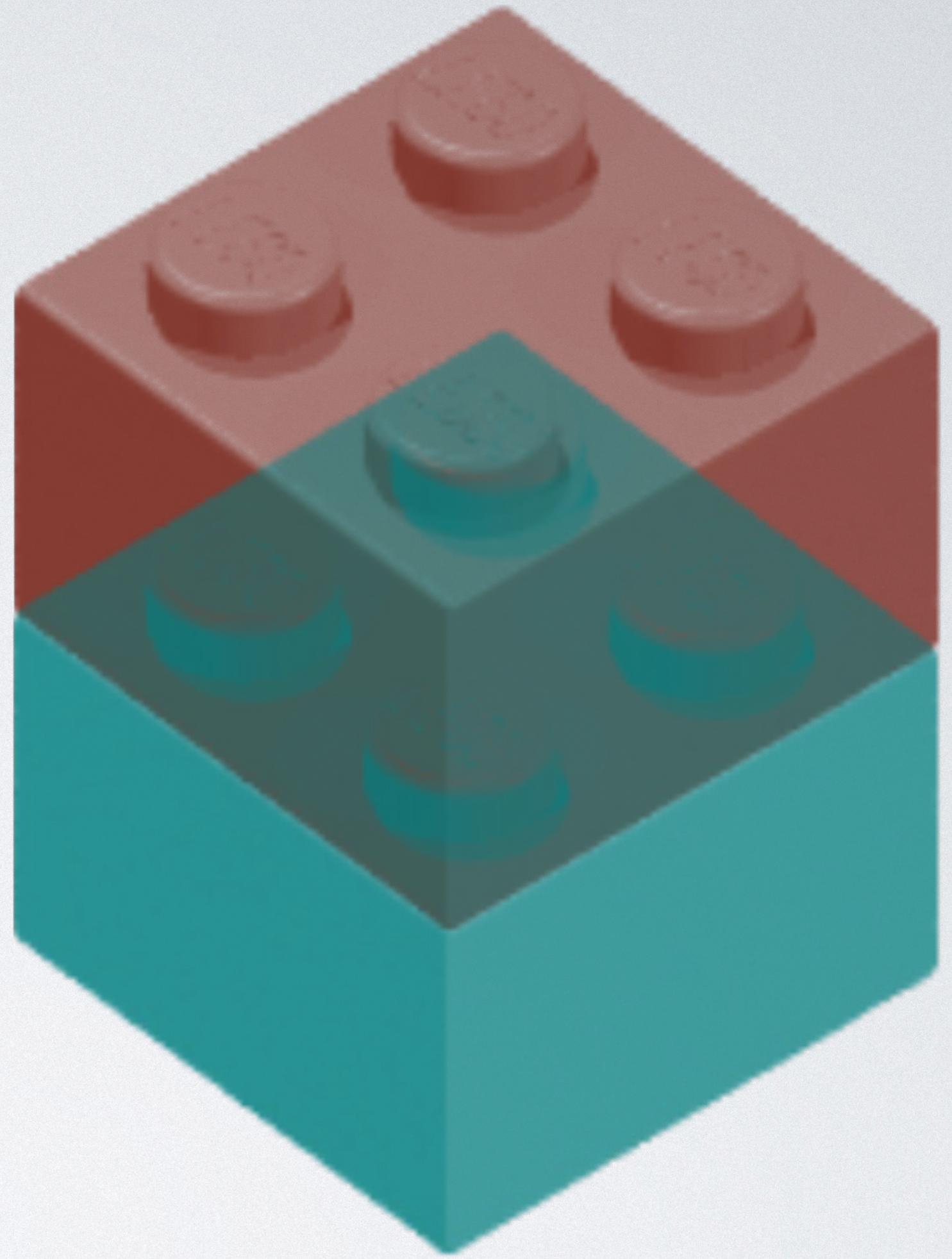


WINDOWS
FEATURE
BRICKS



+

OS



RDSH BRICK

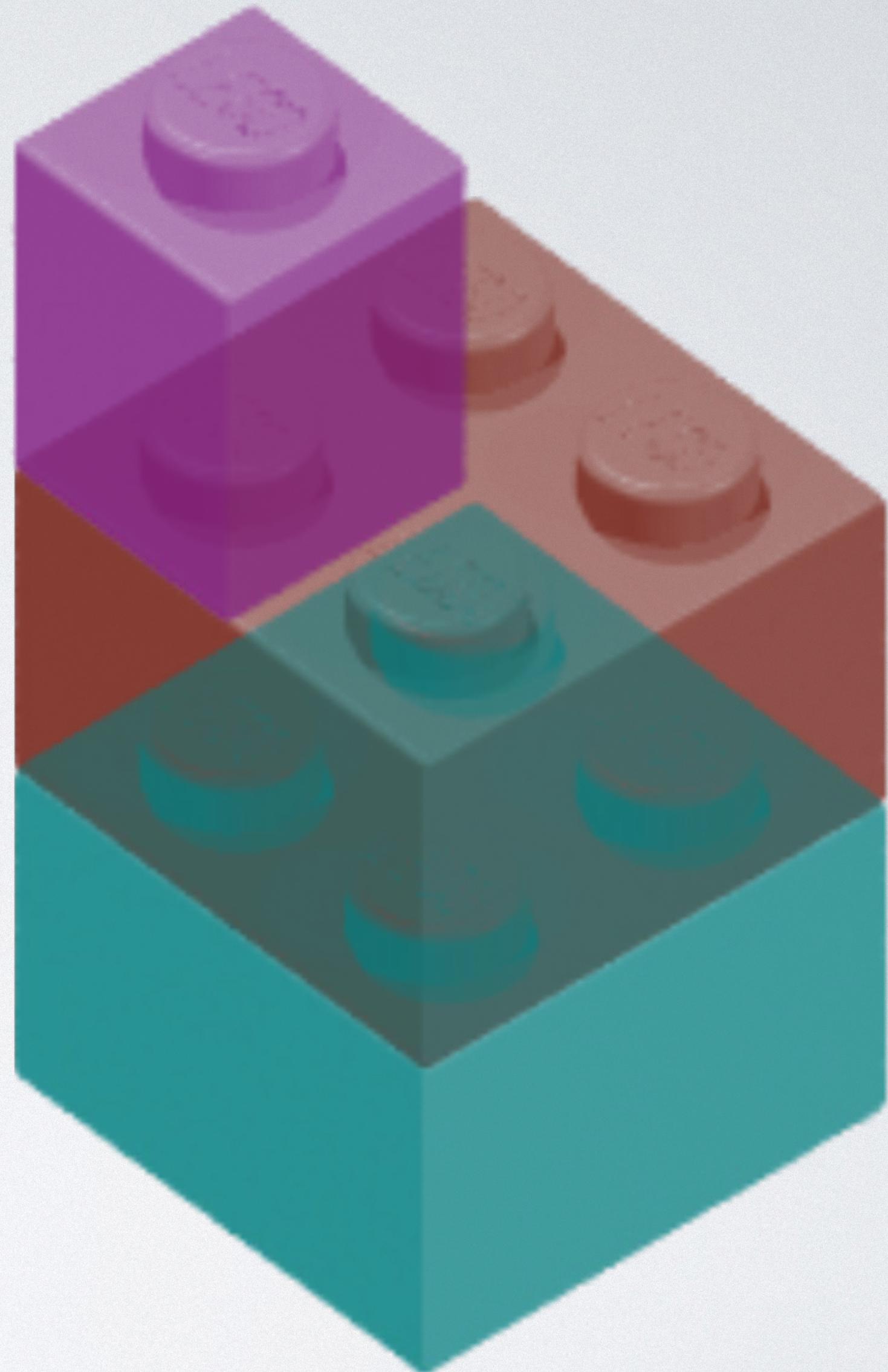
MS VCPP 2008

+

RDSH BRICK

+

OS BRICK



ABOUT_PSADT

- ❖ ONE SCRIPT TO RULE THEM ALL!
- ❖ PRE/INSTALLATION/POST
- ❖ PRE/UNINSTALLATION/POST
- ❖ EXTENSIVE LOGGING (CMTRACE.EXE COMPATIBLE)

PSAPPDEPLOYTOOLKIT.COM



File Edit View Tools Debug Add-ons Help

* < > << >> <<< >>> <<<< >>>> <<<<< >>>>> <<<<<< >>>>>> <<<<<<< >>>>>>>

Deploy-Application.ps1 X

```
124      ##### INSTALLATION #####
125      ##### INSTALLATION #####
126      #####
127      #####
128      [string]$installPhase = 'Installation'
129
130      ## Handle Zero-Config MSI Installations
131      If ($useDefaultMsi) {
132          [hashtable]$ExecuteDefaultMSISplat = @{ Action = 'Install'; Path = $defaultMsiFile }; If ($defaultMspFiles) { $defaultMspFiles | ForEach-Object { Execu
133          Execute-MSI @ExecuteDefaultMSISplat; If ($defaultMspFiles) { $defaultMspFiles | ForEach-Object { Execu
134      }
135
136      ## <Perform Installation tasks here>
137      start-process -FilePath "$labSources\XenDesktop_76\StoreFront_30\CitrixStoreFront-x64.exe" -ArgumentList "
138
139
140      ##### POST-INSTALLATION #####
141      ##### POST-INSTALLATION #####
142      ##### POST-INSTALLATION #####
143      #####
144      [string]$installPhase = 'Post-Installation'
145
146      ## <Perform Post-Installation tasks here>
147
```

Toolkit

File Home Share View

PSAppDeployToolkit_v3.6.7 Toolkit

Favorites

- Desktop
- Downloads
- Recent places

This PC

Citrix StoreFront 3.0.1

PowerShell App Deployment Toolkit

Installation in progress. Please wait...

-Message 'You can customize text to appear at the end o

th a 60 second countdown before automatically closing

Ln 1 Col 1 100%

4 items

File Edit Format View Help

```
<![LOG[Initialization] :: *****LOG!]!><t:  

<![LOG[Initialization] :: *****LOG!]!><t:  

<![LOG[Initialization] :: [Citrix_StoreFront_3.0.1_x64_EN_07] setup started.]LOG!]!><time="13:57:45.50260" date="11  

<![LOG[Initialization] :: Script [C:\Users\Administrator.demolab\Desktop\PACKAGES\Citrix_StoreFront_301\AppDeployT  

<![LOG[Initialization] :: Script [C:\Users\Administrator.demolab\Desktop\PACKAGES\Citrix_StoreFront_301\AppDeployT  

<![LOG[Initialization] :: [Citrix_StoreFront_3.0.1_x64_EN_07] script version is [1.0.0]]LOG!]!><time="13:57:45.56460  

<![LOG[Initialization] :: [Deploy Application] script version is [3.6.5]]LOG!]!><time="13:57:45.56460" date="11-08-  

<![LOG[Initialization] :: [App Deploy Toolkit Main] script version is [3.6.7]]LOG!]!><time="13:57:45.56460" date="11-08-  

<![LOG[Initialization] :: [App Deploy Toolkit Extensions] version is [1.5.0]]LOG!]!><time="13:57:45.57960" date="11-08-  

<![LOG[Initialization] :: Computer Name is [TESTWAP1001.demolab.local]]LOG!]!><time="13:57:45.57960" date="11-08-2015  

<![LOG[Initialization] :: Current User is [demolab\Administrator]]LOG!]!><time="13:57:45.59560" date="11-08-2015" compo  

<![LOG[Initialization] :: OS Version is [Microsoft Windows Server 2012 R2 Standard 64-bit 6.3.9600.0]]LOG!]!><time="13:57:45.62660  

<![LOG[Initialization] :: OS Type is [Server]]LOG!]!><time="13:57:45.62660" date="11-08-2015" component="PSAppDeplo  

<![LOG[Initialization] :: Current Culture is [de-DE] and UI language is [DE]]LOG!]!><time="13:57:45.62660" date="11-08-2015  

<![LOG[Initialization] :: Hardware Platform is [Virtual:VMWare]]LOG!]!><time="13:57:45.72060" date="11-08-2015" compo  

<![LOG[Initialization] :: PowerShell Host is [Windows PowerShell ISE Host] with version [5.0.10514.6]]LOG!]!><time="13:57:45.73560  

<![LOG[Initialization] :: PowerShell Version is [5.0.10514.6 x64]]LOG!]!><time="13:57:45.73560" date="11-08-2015" compo  

<![LOG[Initialization] :: PowerShell CLR (.NET) version is [4.0.30319.34209]]LOG!]!><time="13:57:45.73560" date="11-08-2015" compo  

<![LOG[Initialization] :: *****LOG!]!><time="13:57:45.73560" date="11-08-2015" component="PSAppDeplo  

<![LOG[Initialization] :: Display session information for all logged on users:  

NTAccount : DEMOLAB\Administrator  

SID : S-1-5-21-2038280502-1104451783-2605944950-500  

User Name : Administrator
```

www.sinisasokolic.com on TESTWAP1001 (v5.0.10514.6)

[14:25:32] [C:\Users\Administrator.demolab\Desktop\PACKAGES\Citrix_StoreFront_301|5]# dir

Directory: C:\Users\Administrator.demolab\Desktop\PACKAGES\Citrix_StoreFront_301

Mode	LastWriteTime	Length	Name
----	-----	-----	-----
d----	06.11.2015	11:47	AppDeployToolkit
d----	06.11.2015	12:02	Files
-a----	22.09.2015	18:09	314880 Deploy-Application.exe
-a----	22.09.2015	18:09	184 Deploy-Application.exe.config
-a----	06.11.2015	14:20	8717 Deploy-Application.ps1

[14:25:33] [C:\Users\Administrator.demolab\Desktop\PACKAGES\Citrix_StoreFront_301|5]# .\Deploy-Application.exe install

ABOUT_NEXT

- DEPLOY BRICKS WITH POWERSHELL SCRIPT
- ESD
- POWERSHELL DSC
 - PACKAGE OR WINDOWSPROCESS RESOURCE
- TAKE CARE OF INSTALLATION ORDER AND DEPENDENCIES
- ADD BUILDS, STAGING AND LOGGING



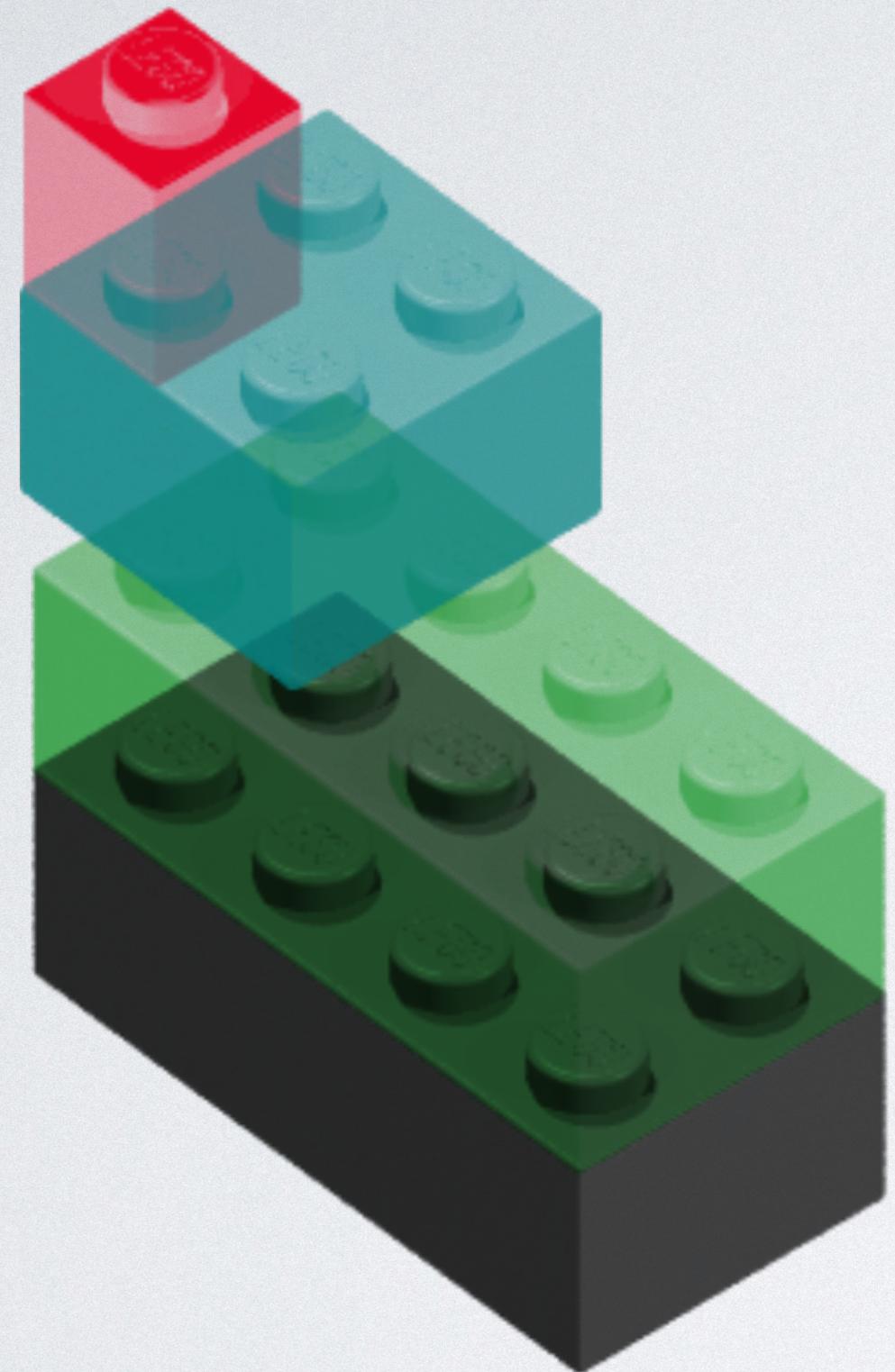
LET'S LEGOFY SOMETHING...

ABOUT_LEGOFYING_XENDESKTOP 7.6

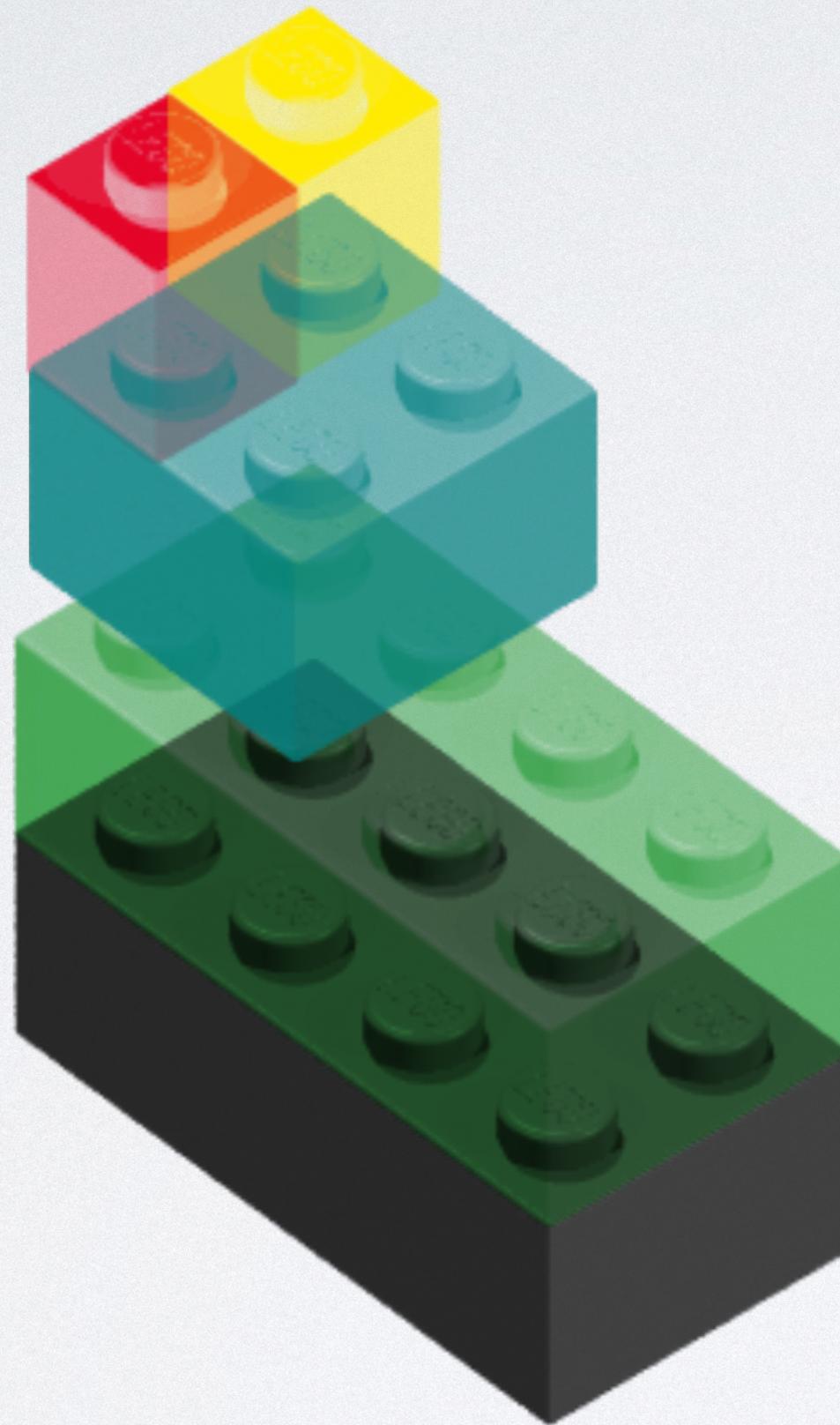
- ❖ SCOPE: CITRIX LICENSE SERVER, STOREFRONT, CONTROLLER, SERVER VDA
- ❖ 72 DIFFERENT WINDOWS SERVER ROLES/SUBROLES AND FEATURES
- ❖ 5 DIFFERENT VISUAL C++ REDISTRIBUTABLES
- ❖ 14 DIFFERENT CITRIX COMPONENTS

ABOUT_XENDESKTOP_BRICKS

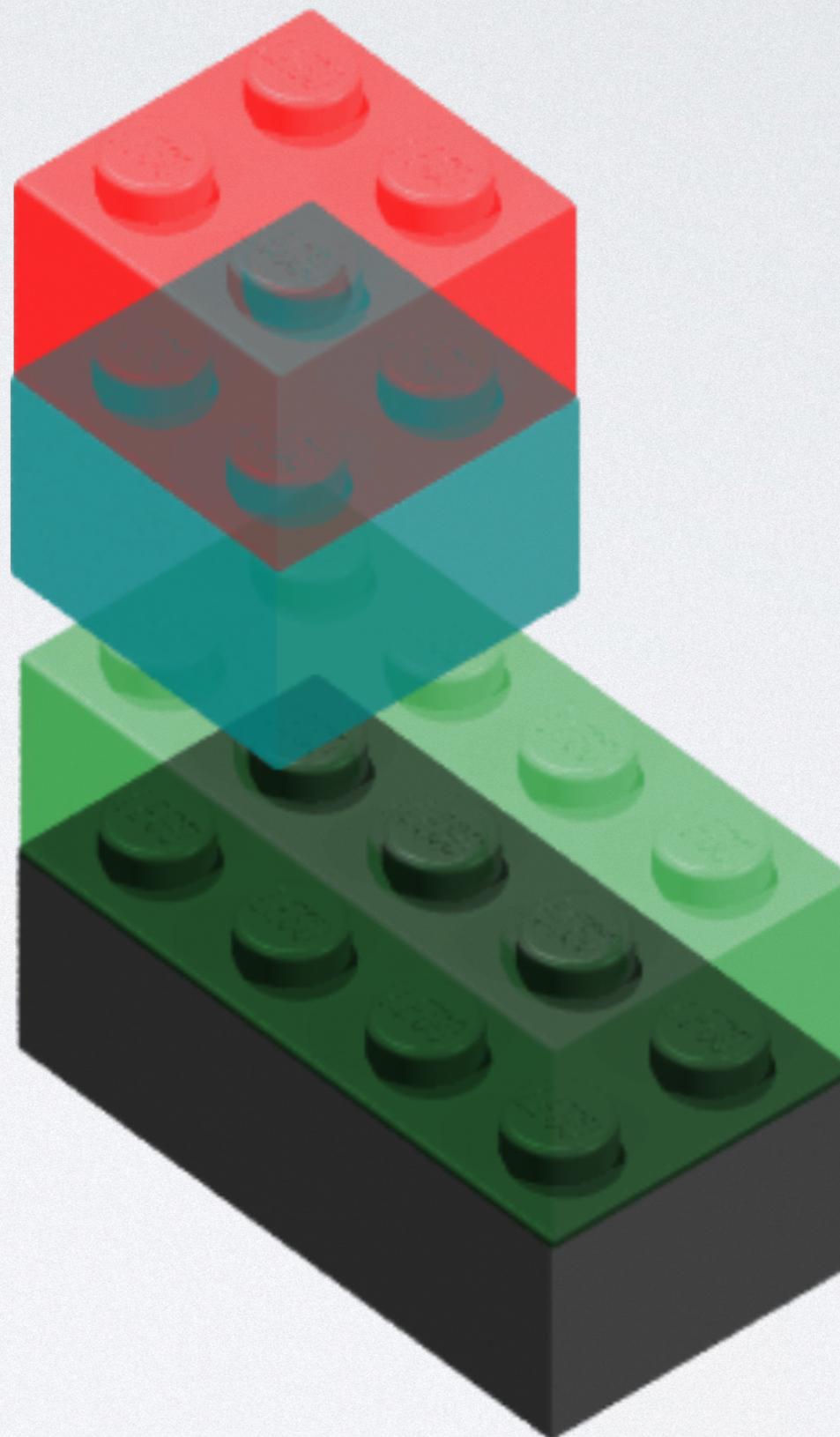
Standard Windows Server 2012 R2 Server	License Server	Controller	StoreFront	Server VDA
File and Storage Services	File and Storage Services	File and Storage Services	File and Storage Services	File and Storage Services
Storage Services	Storage Services	Storage Services	Storage Services	Storage Services
			Web Server (IIS)	Remote Desktop Services
			Web Server	Web Server (IIS)
			Common HTTP Features	Web Server
			Default Document	Common HTTP Features
			Directory Browsing	Default Document
			HTTP Errors	Directory Browsing
			Static Content	HTTP Errors
			HTTP Redirection	Static Content
			Health and Diagnostics	Health and Diagnostics
			HTTP Logging	HTTP Logging
			Tracing	Logging Tools
			Performance	Tracing
			Static Content Compression	Performance
			Security	Static Content Compression
			Request Filtering	Dynamic Content Compression
			Basic Authentication	Security
			Windows Authentication	Request Filtering
			Application Development	Basic Authentication
			.NET Extensibility 4.5	Windows Authentication
			Application Initialization	Application Development
			ASP.NET 4.5	.NET Extensibility 4.5
			CGI	ASP
			ISAPI Extensions	ASP.NET 4.5
			ISAPI Filters	CGI
			Management Tools	ISAPI Extensions
			IIS Management Console	ISAPI Filters
			IIS Management Scripts and Tools	Management Tools
				IIS Management Console
				IIS 6 Management Compatibility
				IIS 6 Metabase Compatibility
				IIS 6 Scripting Tools
				IIS 6 WMI Compatibility
				IIS Management Scripts and Tools
				Management Service
				.NET Framework 3.5 Features
				NET Framework 3.5 (Includes .NET 2.0 and 3.0)
NET Framework 4.5 Features	NET Framework 4.5 Features	NET Framework 4.5 Features	NET Framework 4.5 Features	NET Framework 4.5 Features
NET Framework 4.5	NET Framework 4.5	NET Framework 4.5	NET Framework 4.5	NET Framework 4.5
WCF Services	WCF Services	WCF Services	WCF Services	WCF Services
TCP Port Sharing	TCP Port Sharing	TCP Port Sharing	TCP Port Sharing	TCP Port Sharing
SMB 1.0/CIFS File Sharing Support	SMB 1.0/CIFS File Sharing Support	SMB 1.0/CIFS File Sharing Support	SMB 1.0/CIFS File Sharing Support	SMB 1.0/CIFS File Sharing Support
User Interfaces and Infrastructure	User Interfaces and Infrastructure	User Interfaces and Infrastructure	User Interfaces and Infrastructure	User Interfaces and Infrastructure
Graphical Management Tools and Infrastructure	Graphical Management Tools and Infrastructure	Graphical Management Tools and Infrastructure	Graphical Management Tools and Infrastructure	Graphical Management Tools and Infrastructure
Server Graphical Shell	Server Graphical Shell	Server Graphical Shell	Server Graphical Shell	Server Graphical Shell
Windows PowerShell	Windows PowerShell	Windows PowerShell	Windows PowerShell	Windows PowerShell
Windows PowerShell 4.0	Windows PowerShell 4.0	Windows PowerShell 4.0	Windows PowerShell 4.0	Windows PowerShell 4.0
Windows PowerShell 2.0 Engine	Windows PowerShell 2.0 Engine	Windows PowerShell 2.0 Engine	Windows PowerShell 2.0 Engine	Windows PowerShell 2.0 Engine
Windows PowerShell ISE	Windows PowerShell ISE	Windows PowerShell ISE	Windows PowerShell ISE	Windows PowerShell ISE
WoW64 Support	WoW64 Support	WoW64 Support	WoW64 Support	WoW64 Support
		Microsoft Visual C++ 2008 Redistributable - x64 9.0.30729.4148	Microsoft Visual C++ 2008 Redistributable - x64 9.0.30729.4148	Microsoft Visual C++ 2008 Redistributable - x64 9.0.30729.4148
			Microsoft Visual C++ 2010 Redistributable - x64 10.0.30319	Microsoft Visual C++ 2010 Redistributable - x64 10.0.30319
			Microsoft Visual C++ 2010 Redistributable - x86 10.0.30319	Microsoft Visual C++ 2010 Redistributable - x86 10.0.30319
			Microsoft Visual C++ 2013 Redistributable - x64 12.0.21005.1	Microsoft Visual C++ 2013 Redistributable - x64 12.0.21005.1
			Microsoft Visual C++ 2013 Redistributable - x86 12.0.21005.1	Microsoft Visual C++ 2013 Redistributable - x86 12.0.21005.1
		Citrix Broker Service 7.6.2		
		Citrix ConfigMgr WOL 7.6.2		
		Citrix Group Policy Extension 2.5.0.0	Citrix Group Policy Extension 2.5.0.0	
		Citrix Hostservice 7.6.2		
		Citrix MachineCreationServices 7.6.2		
		Citrix Monitor Service PowerShell Snap-In 7.6.2		
		Citrix Studio 7.6.2	Citrix Studio 7.6.2	
		Citrix MonitoringService 7.6.2		
		Citrix XenDesktop PowerShell Module 7.6.2	Citrix XenDesktop PowerShell Module 7.6.2	
		Citrix XenDesktop 7.6		
			Citrix Director 7.6.300	
			Citrix Receiver 14.3.100.10	
			Citrix Virtual Delivery Agent 7.6.300	



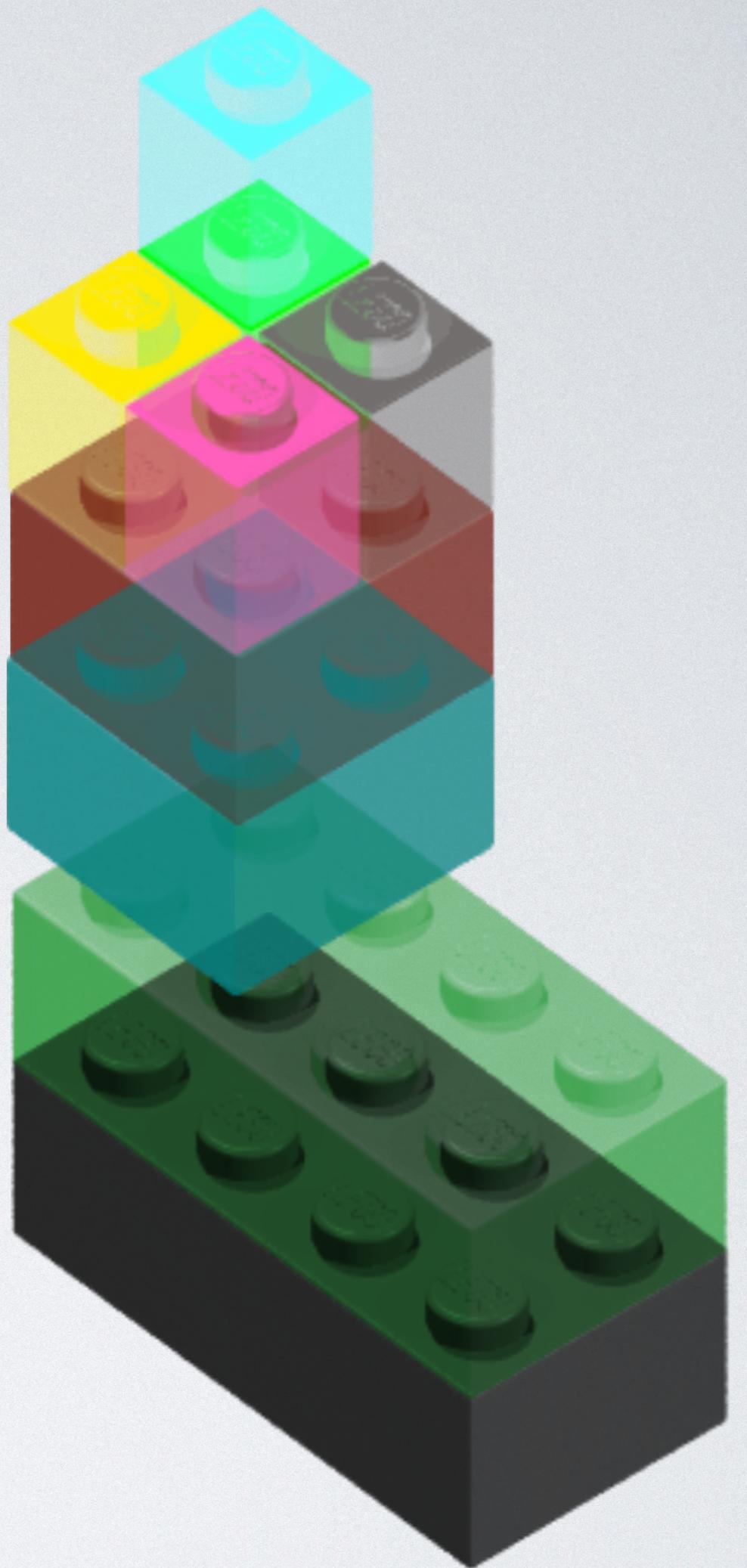
LICENSE



CONTROLLER



STOREFRONT



SERVER VDA

ABOUT_PERCENTAGES

- ◆ 39 UNIQUE BRICKS OUT OF 91
- ◆ 38 BRICKS ARE USED MORE THAN ONCE
- ◆ 14 BRICKS ARE USED ON EVERY SYSTEM

42,86% UNIQUE

BUT...

ABOUT_UNIQUENESS

❖ RDSH

❖ REMOTE ASSISTANCE

❖ DESKTOP EXPERIENCE

ABOUT_COSTS

- AUTOMATION NEEDS TIME
- VERSIONING IS CRUCIAL
- STAGING IS A MUST

ABOUT TIME

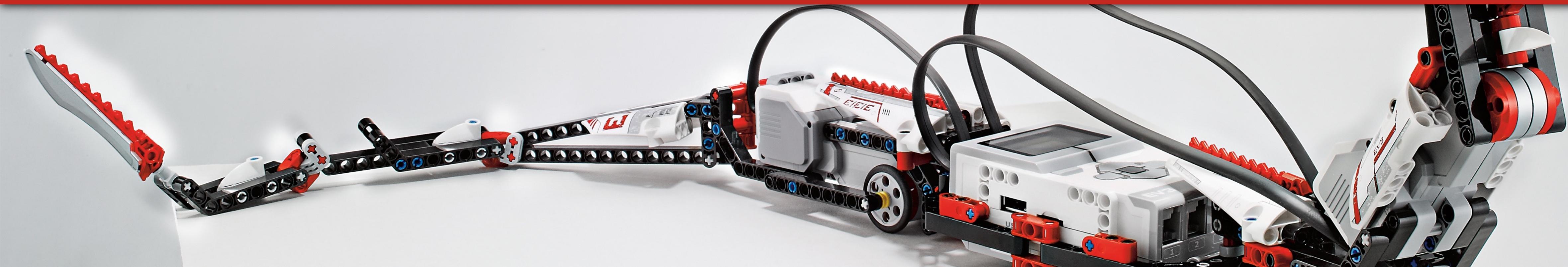
The image displays three windows side-by-side, illustrating a workflow for server configuration:

- Server Manager:** Shows basic server information for "TESTWAP1001".

Host Name:	TESTWAP1001
User Name:	Administrator
IP Address:	192.168.120.133
Subnet Mask:	255.255.255.0
Default Gateway:	192.168.120.2
DNS Server:	192.168.120.128
CPU:	2.60 GHz Intel Core i7-4960HQ
Memory:	2048 MB
OS Version:	Windows 2012 R2
Service Pack:	No service pack
Volumes:	C:\ 59.66 GB NTFS
Free Space:	C:\ 46.26 GB NTFS
Logon Server:	DEMOWDC1001
Machine Domain:	demolab
- PowerShell:** Shows the command "add-windowsfeature web-server" entered in the command line.
- Script:** A screenshot of a script editor window titled "install_web-server.ps1" containing the PowerShell command "add-windowsfeature web-server".



ABOUT_PROBLEMS

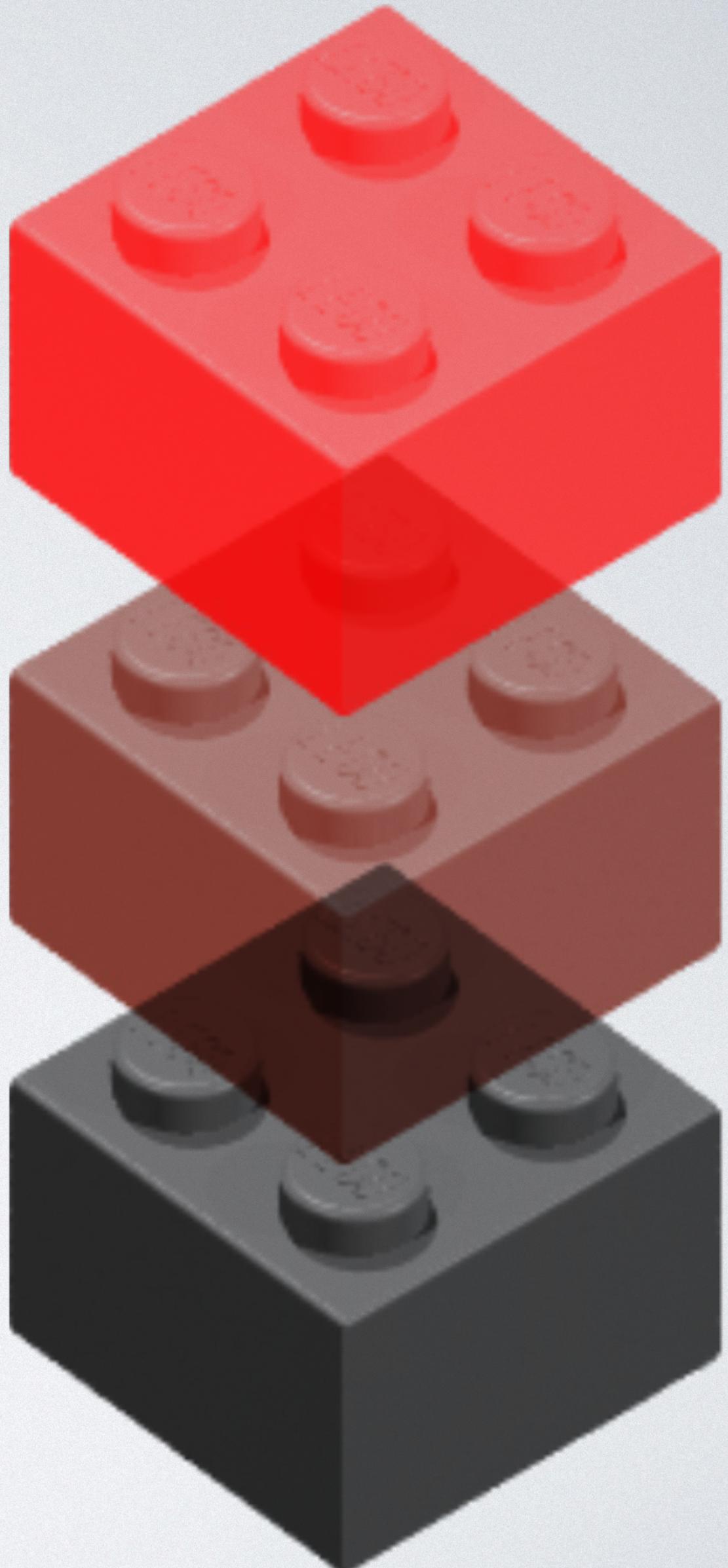


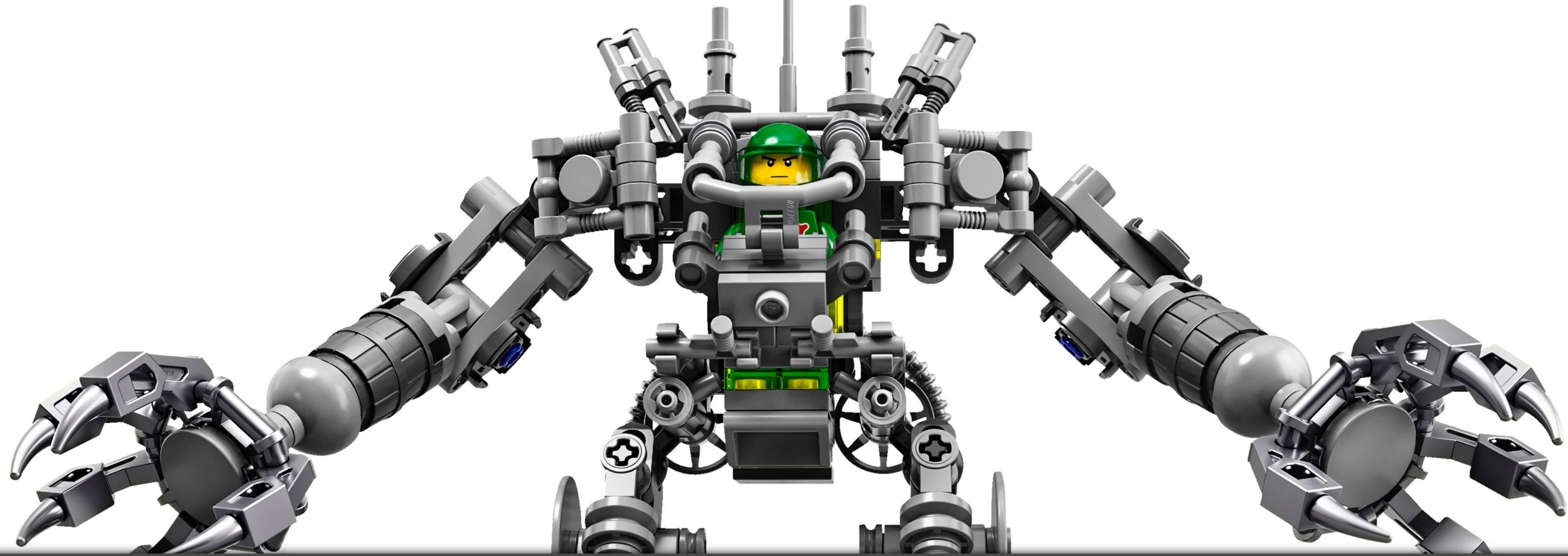
ABOUT_PROBLEMS

- ❖ S*...TY APPLICATIONS
- ❖ ADMINS THAT DO STUFF MANUALLY
- ❖ LACK OF DOCUMENTATION
- ❖ TIME
- ❖ MONITORING AND STAGING
- ❖ UNINSTALL ROUTINES DON'T REMOVE PREREQUISITES

ABOUT_LAYERS

- LAYERS ARE ONLY A BRICK
- THEY WON'T SOLVE ALL OF YOUR PROBLEMS
- USE THEM FOR SPECIAL CASES





ABOUT_CONFIGURATION

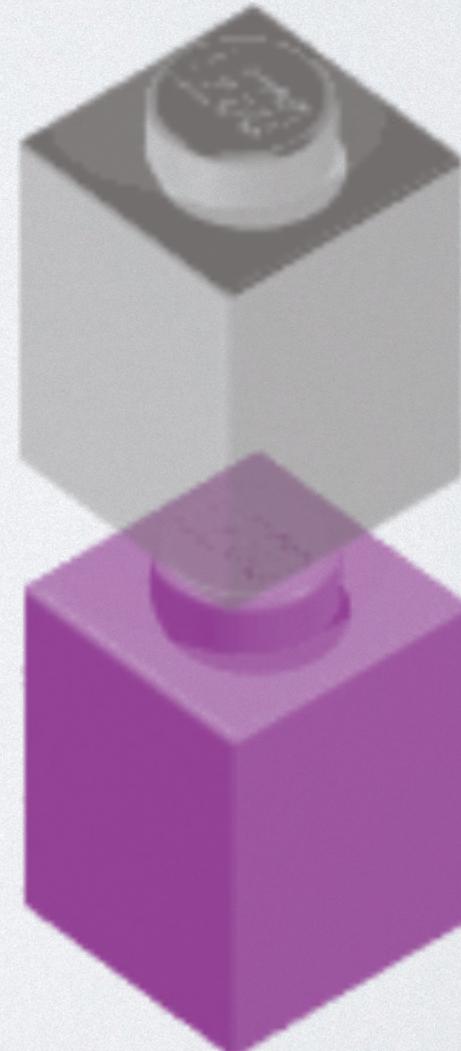
ABOUT_CONFIGURATION

- TRY TO AVOID HARD-CODED CONFIGURATIONS IN OS
- CREATE GENERIC INSTALLATION PACKAGES WHEREVER POSSIBLE
- SEPARATE INSTALLATION, CONFIGURATION AND THE USER
- USE SCRIPTS, GPOS, APPSENSE... OR FSLOGIX

ABOUT_



- ❖ PREREQ: VISUAL C++ 2012 REDISTRIButable
- ❖ AGENT-INSTALL: SETUP.EXE /INSTALL /QUIET /NORESTART



File Edit Help



New Rule Set File

system

Organize New folder

Name Date modified Type

	Name	Date modified	Type
	system.fxr	09.11.2015 08:58	FSLogix R

Favorites

- Desktop
- Downloads
- Recent places

This PC

- Desktop
- Documents
- Downloads
- Music
- Pictures
- Videos
- Local Disk (C:)

File name: Microsoft_Visio Rule Set File (*.fxr)

Enter file name Cancel

A modal dialog titled "New Rule Set File" showing a file list. The list contains one item, "system.fxr", which is a FSLogix Rule Set file modified on 09.11.2015 at 08:58. The dialog includes a sidebar with "Favorites" and "This PC" sections, and a bottom section for entering a new file name ("Microsoft_Visio") and selecting the rule set file type ("Rule Set File (*.fxr)").

[13:28:37] [C:\Program Files\FSLogix\Apps | 25]# .\frx.exe help

Usage:

frx.exe <command> <parameters>

Commands:

help, ?	Display this help message
version	Display the versions of the loaded components
add-rule	Add the specified rule
del-rule	Delete the specified rule
list-rules	List currently loaded rules
reload-rules	Reload rules from cache
set-key	Validates and store the product key
validate-key	Validates a product key
enable-shnot	Enables shell refresh notification
report-assignment	Rule set applicability reporting
copy-profile	Copy a user's profile into a VHD or VHDX
edit-profile	Edit profile contents contained in a VHD or VHDX
create-vhd	Create and format a VHD or VHDX
copyto-vhd	Copy a folder and its contents to a VHD or VHDX
moveto-vhd	Move a folder and its contents to a VHD or VHDX
regfont	Registers a font in the system font table
unregfont	Removes a font from the system font table
create-junction	Creates a junction point to a target volume or folder
show-junction-info	Shows information about a junction point
create-ruleset	Creates a Rule Set

Type 'frx help <command>' for help on a specific command (if available).

[13:28:44] [C:\Program Files\FSLogix\Apps | 25]#

[13:31:09] [C:\Program Files\FSLogix\Apps | 25]# .\frx.exe help add-rule

add-rule

Add the specified rule

Parameters:

[Rule Type] Only one of the following rule types may be specified

-hide Hiding rule

-redirect Redirection rule

-vhd-attach VHD auto-attach rule

-printer Printer hiding rule

-specific-data Returns specific data for a registry value

-src-parent Parent directory/key or printer to which the rule applies

-src *File or value name

-dest-parent *Destination directory or key (redirection rules only)

-dest *Destination file or value (redirection rules only)

-no-copy *Creates a blank copy of the item upon redirection if it does not exist (default is to copy the source item)

-volatile *volatile rule that will not persist across a machine reboot

-datatype *Type of specific data to return (sz, DWORD)

-data *Hexadecimal representation of data to return

* Optional parameters

Special variables (usable in -dest-parent/-dest parameters):

__USER_SID__ User's SID

__USER_NAME__ User's username

__USER_PROFILE_PATH__ Path to users profile

Examples:

frx add-rule -redirect -src-parent C:\Windows -src=test.ini
-dest-parent __USER_PROFILE_PATH__ -dest test.ini

frx add-rule -hide -src-parent C:\Windows

frx add-rule -hide -src-parent \Registry\User*\Software -src MySoftware

frx add-rule -specific-data -src-parent \Registry\Machine\Software -src value
-datatype DWORD -data 42000000

frx add-rule -vhd-attach -src-parent C:\MyVolFolder -dest C:\VHDS\mydisk.vhd

[13:31:10] [C:\Program Files\FSLogix\Apps | 25]# |

```
[13:31:55] [C:\Program Files\FSLogix\Apps | 25]# .\frx.exe help create-rule  
create-ruleset  
Creates a Rule Set by scanning the specified install directory.
```

Parameters:

- name Specifies the name of the file to be created
- install-dir Specifies the installation path of the application to be scanned.
- ARP-keyname Specifies the Add/Remove Program registry location

Example:

```
frx create-ruleset  
-name Chrome  
-install-dir "C:\Program Files\Google\Chrome\Application"  
-ARP-keyname "HKLM\Software\Wow6432Node\Microsoft\Windows\  
CurrentVersion\Uninstall\Google Chrome"
```

```
[13:32:02] [C:\Program Files\FSLogix\Apps | 25]# |
```

ABOUT_REGISTRY

- GET-CHILDITEM HKLM:\SOFTWARE\MICROSOFT\WINDOWS\CURRENTVERSION\UNINSTALL |
FOREACH-OBJECT {GET-ITEMPROPERTY \$_.PSPATH} | FT -WRAP
DISPLAYNAME,PSCHILDNAME,UNINSTALLSTRING
- GET-CHILDITEM
HKLM:\SOFTWARE\WOW6432NODE\MICROSOFT\WINDOWS\CURRENTVERSION\UNINSTALL |
FOREACH-OBJECT {GET-ITEMPROPERTY \$_.PSPATH} | FT -WRAP
DISPLAYNAME,PSCHILDNAME,UNINSTALLSTRING
- (GET-ITEMPROPERTY -PATH "HKLM:\SOFTWARE\MICROSOFT\WINDOWS\CURRENTVERSION\APP
PATHS\7ZFM.EXE" -NAME "PATH").PATH

Untitled4.ps1* Untitled3.ps1 X Untitled2.ps1

```
1 Get-ChildItem hklm:\software\microsoft\windows\currentversion\uninstall |  
2 ForEach-Object {Get-ItemProperty $_.pspath} |  
3 ft -wrap DisplayName,PSChildName
```

DisplayName

citrix virtual delivery agent 7.6.300

citrix personalization appv - vda

citrix enhanced desktop experience

7-zip 9.20 (x64 edition)

FSLogix Apps

Citrix Überwachungsdienst-VDA-Plug-In

Microsoft visual C++ 2012 x64 Additional Runtime - 11.0.51106

Citrix Virtual Desktop Agent - x64

Microsoft visual C++ 2008 Redistributable - x64 9.0.30729.4148

Citrix Director VDA Plugin

Citrix HDX TS (retail)

Microsoft visual C++ 2012 x64 Minimum Runtime - 11.0.51106

Microsoft visual C++ 2008 Redistributable - x64 9.0.30729.6161

Citrix Universal Print Client

Citrix XenDesktop PowerShell Module

Citrix Gruppenrichtlinie - clientseitige Erweiterung 2.5.0.0

Microsoft silverlight

Microsoft visual C++ 2013 x64 Additional Runtime - 12.0.21005

Citrix Profile Management

Microsoft visual C++ 2013 x64 Minimum Runtime - 12.0.21005

Citrix Telemetry Service - x64

FSLogix Apps RuleEditor

Citrix Studio

WMI-Maschinenverwaltungsprovider

Microsoft visual C++ 2010 x64 Redistributable - 10.0.30319

VMware Tools

Citrix HDX MediaStream für Flash - Server

Machine Identity Service Agent

Citrix WMI Proxy Plugin

PSChildName

Citrix Virtual Desktop Agent
Connection Manager

WIC

{107EDF0D-3573-4406-9C73-1C7823E6A2BB}

{17A82765-3063-498D-A8B1-99621783C542}

{23170F69-40C1-2702-0920-000001000000}

{2E7EBF8F-9A8E-4C2D-9034-D706E8335E40}

{30C152F9-BA27-4C97-997C-EA02A68397E1}

{3C28BFD4-90C7-3138-87EF-418DC16E9598}

{432B6E43-AAE2-4597-BBB5-C6042D5D0EA9}

{4B6C7001-C7D6-3710-913E-5BC23FCE91E6}

{4CF00644-C938-4460-8EC8-7E02953FD623}

{560DA84F-78EA-4BBB-A631-962E9EFE387C}

{5AF4E09F-5C9B-3AAF-B731-544D3DC821DD}

{5FCE6D76-F5DC-37AB-B2B8-22AB8CEDB1D4}

{763D53C3-F38E-4E53-96A4-944D484F7C4E}

{881C08AF-9E04-4EAE-80D1-521DDA3914E5}

{89092F49-1203-4924-A1FE-D569A834509B}

{89F4137D-6C26-4A84-BDB8-2E5A4BB71E00}

{929FB26-9020-399B-9A7A-751D61F0B942}

{989065E3-46A8-461B-8B99-1D5A48A170BB}

{A749D8E6-B613-3BE3-8F5F-045C84EBA29B}

{C05B8C90-EA56-4F89-87A7-2735008C0F46}

{C095B193-946B-4CCB-88AC-8E24926B1433}

{C29D9D02-0E3C-4180-A449-A317DBD0A209}

{C972449C-0C4A-42EE-9119-F33833B3FDA7}

{DA5E371C-6333-3D8A-93A4-6FD5B20BCC6E}

{DEF7786E-224B-48AB-A872-8D255D0F8124}

{E10448FE-D08D-432D-B9BA-9571B6F6AE6F}

{E6878638-D071-4C92-9831-2DED24D95E62}

{E72DD434-D750-443D-8E06-088BF51C8C61}

Untitled4.ps1*

Untitled3.ps1

Untitled2.ps1

Untitled5.ps1* X

```
1 |(Get-ItemProperty -path "HKLM:\SOFTWARE\Microsoft\Windows\CurrentVersion\App Paths\7zFM.exe" -name "path").Path
```

<

...

>

```
[18:17:57] [C:\Program Files\FSLogix\Apps|25]# (Get-ItemProperty -path "HKLM:\SOFTWARE\Microsoft\Windows\CurrentVersion\App Paths\7zFM.exe" -name "path").Path  
C:\Program Files\7-zip\
```

```
[18:18:03] [C:\Program Files\FSLogix\Apps|25]#
```

Untitled4.ps1* Untitled3.ps1 Untitled2.ps1 X Untitled5.ps1*

```
1 & "C:\Program Files\FSLogix\Apps\frx.exe" create-ruleset -name "C:\Program Files\FSLogix\Apps\Rules\citrixStudio.frx" `  
2 -install-dir "C:\Program Files\Citrix\Desktop Studio" -ARP-Keyname `  
3 "HKLM\software\Microsoft\windows\current version\uninstall\{C29D9D02-0E3C-4180-A449-A317DBD0A209}"
```

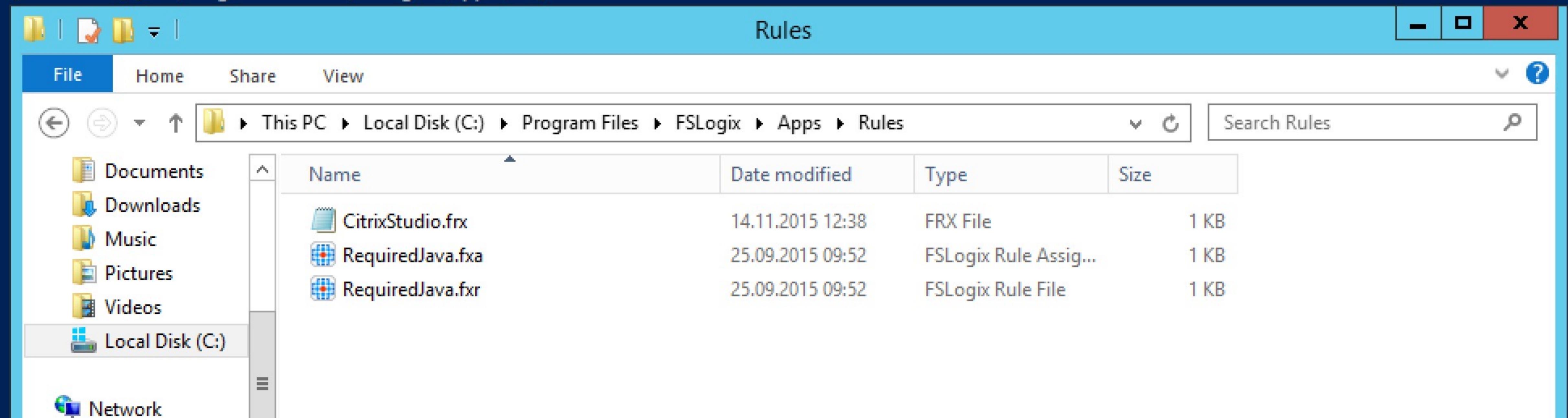
```
[12:38:33] [C:\Program Files\FSLogix\Apps | 25]# c:\users\Administrator.demolab\Documents\Untitled2.ps1  
Scanning shortcut files  
Scanning Services and Drivers  
Scanning Run entries  
Scanning ProgIDs  
Scanning Open With registrations  
Scanning COM objects  
Scanning Microsoft office Add-ins  
Scanning Browser Helper Objects  
Complete  
Rule File created successfully  
Rules written to file  
  
[12:38:36] [C:\Program Files\FSLogix\Apps | 25]# |
```

Untitled4.ps1* Untitled3.ps1 Untitled2.ps1 X Untitled5.ps1*

```
1 & "C:\Program Files\FSLogix\Apps\frx.exe" create-ruleset -name "C:\Program Files\FSLogix\Apps\Rules\citrixStudio.frx" `  
2 -install-dir "C:\Program Files\Citrix\Desktop Studio" -ARP-Keyname `  
3 "HKLM\software\Microsoft\windows\current version\uninstall\{C29D9D02-0E3C-4180-A449-A317DBD0A209}"
```

```
[12:38:33] [C:\Program Files\FSLogix\Apps | 25]# c:\users\Administrator.demolab\Documents\Untitled2.ps1  
Scanning shortcut files  
Scanning Services and Drivers  
Scanning Run entries  
Scanning ProgIDs  
Scanning Open With registrations  
Scanning COM objects  
Scanning Microsoft office Add-ins  
Scanning Browser Helper Objects  
Complete  
Rule File created successfully  
Rules written to file
```

```
[12:38:36] [C:\Program Files\FSLogix\Apps | 25]#
```

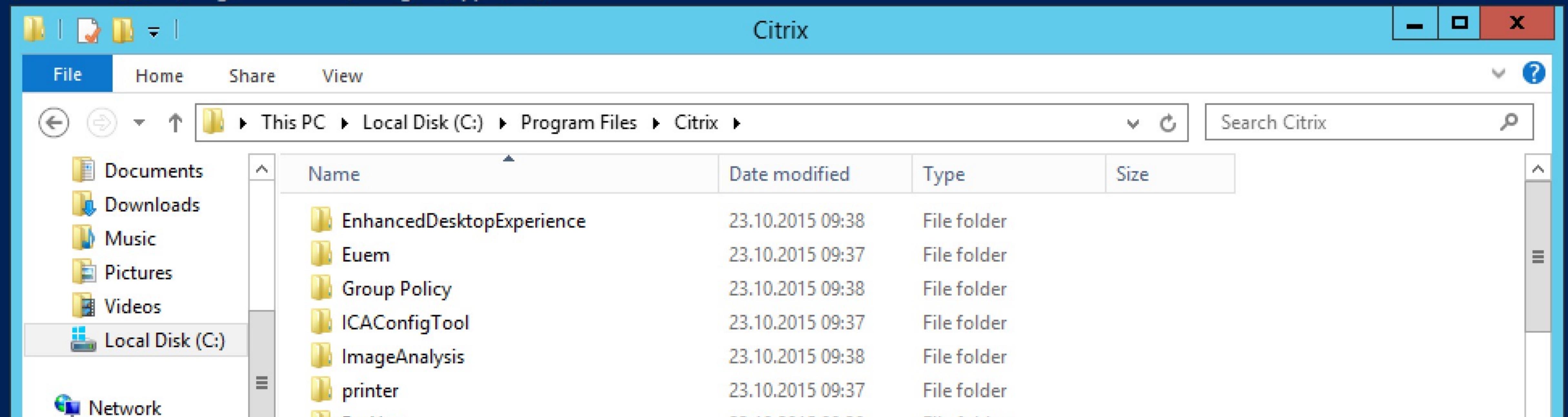


Untitled4.ps1* Untitled3.ps1 Untitled2.ps1 X Untitled5.ps1*

```
1 & "C:\Program Files\FSLogix\Apps\frx.exe" create-ruleset -name "C:\Program Files\FSLogix\Apps\Rules\citrixStudio.frx" `  
2 -install-dir "C:\Program Files\Citrix\Desktop Studio" -ARP-Keyname `  
3 "HKLM\software\Microsoft\windows\current version\uninstall\{c29d9d02-0e3c-4180-a449-a317dbd0a209}"
```

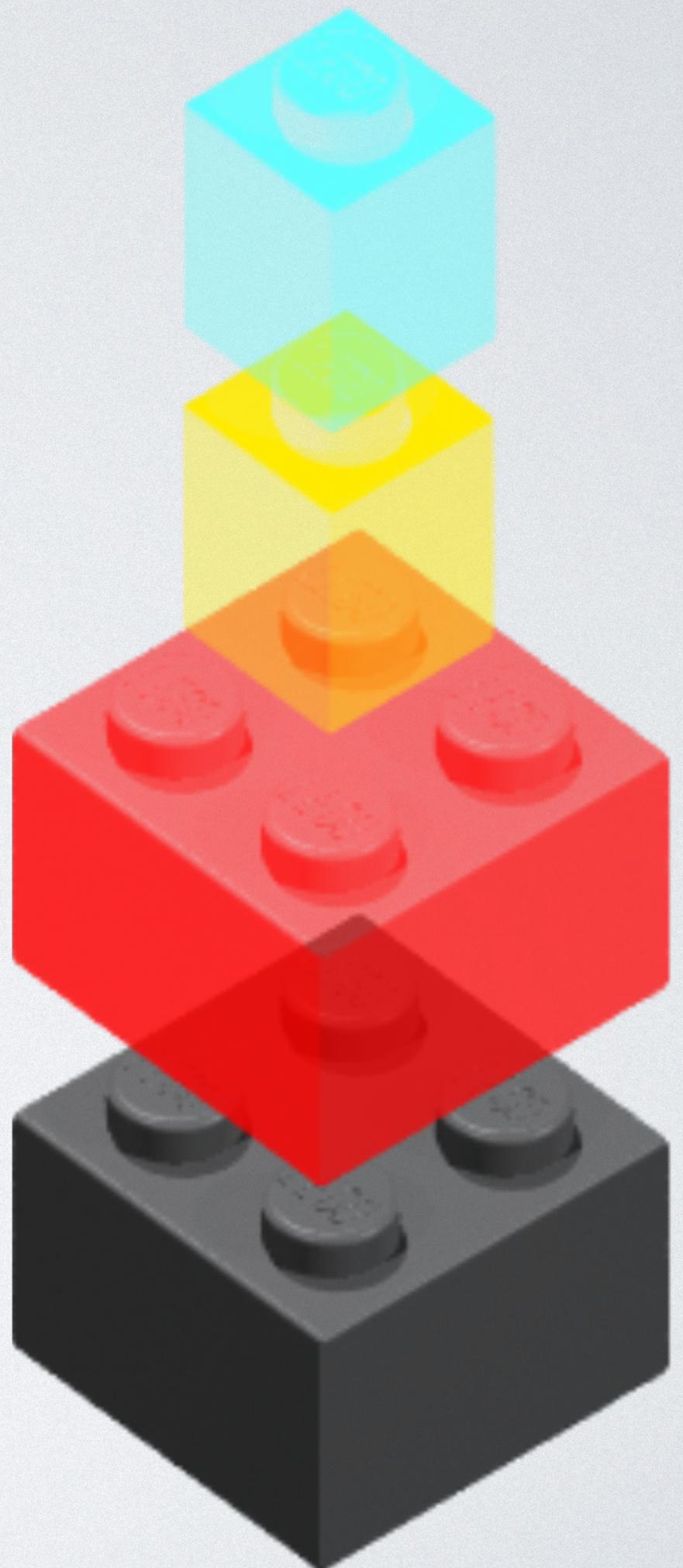
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Scanning ProgIDs  
Scanning Open With registrations  
Scanning COM objects  
Scanning Microsoft office Add-ins  
Scanning Browser Helper Objects  
Complete  
Rule File created successfully  
Rules written to file
```

```
[12:38:36] [C:\Program Files\FSLogix\Apps | 25]#
```



ABOUT_CONFIGURATION_BRICKS

- WE CREATED A CONFIGURATION BRICK
- BUILD IT ON TOP OF YOUR INSTALLATION BRICK



ABOUT_ADDITIONAL_STUFF

- ❖ KEEP OS AND PACKAGES AS VANILLA AS POSSIBLE
- ❖ SEPARATE INSTALLATION FROM CONFIGURATION
- ❖ INTRODUCE CHANGE PROCESSES
- ❖ VIRTUALIZATION ADDS ADDITIONAL COMPLEXITY

MORE INFORMATION?

PowerShell AppDeployment Toolkit
<http://psappdeploytoolkit.com>

PowerShell DSC
<https://msdn.microsoft.com/en-us/PowerShell/dsc/overview>

FSLogix
www.fslogix.com

THANK YOU!



@sinisasokolic

www.sinisasokolic.com

WWW.RISCONSULTING.DE