

Windows PowerShell Starter

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PROGRAMAR
Saturday 2017

```
e.Date = new DateTime(2017, 4, 1);  
e.Location = "Microsoft Lisbon Experience, Lisboa, Portugal";
```



CoderDojo LX



Office 365
Portugal



PASS



GLOBAL PORTUGUESE
VIRTUAL GROUP



> Agenda

What is Windows PowerShell

What are Cmdlets ?

Variables

Functions

Statements and Operators

Modules

Great Things

Q & A

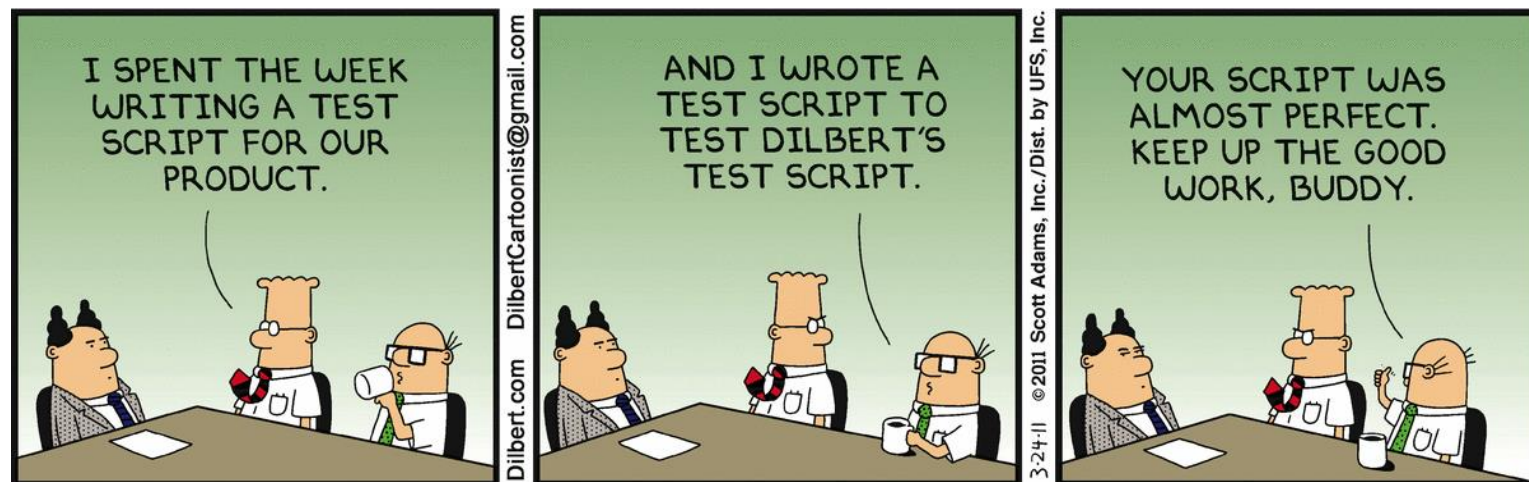


Image source: <http://dilbert.com/strip/2011-03-24>

> Get-About -Name "Ricardo Cabral"

- IT Manager at Globaltemp
- Degree in Computer Engineering
- Actively participating, volunteering and/or speaking Portuguese community meetings (Azure PT, Arduino Day, Cloud Pro PT, IT Pro Portugal, Netponto, O365PT, PowerShell Portugal, PTJUG, SQLPort, SQLSaturday Lisboa & Porto, Tuga IT, etc.)
- Passionate and self-taught in information technology with over 13 years' of experience in IT management, development and projects.
- Loves sharing, living and learning.

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Solutions Associate

Cloud Platform

> What is Windows PowerShell

⊙ Is a product code for new Windows OS ?

⊙ Microsoft Definition

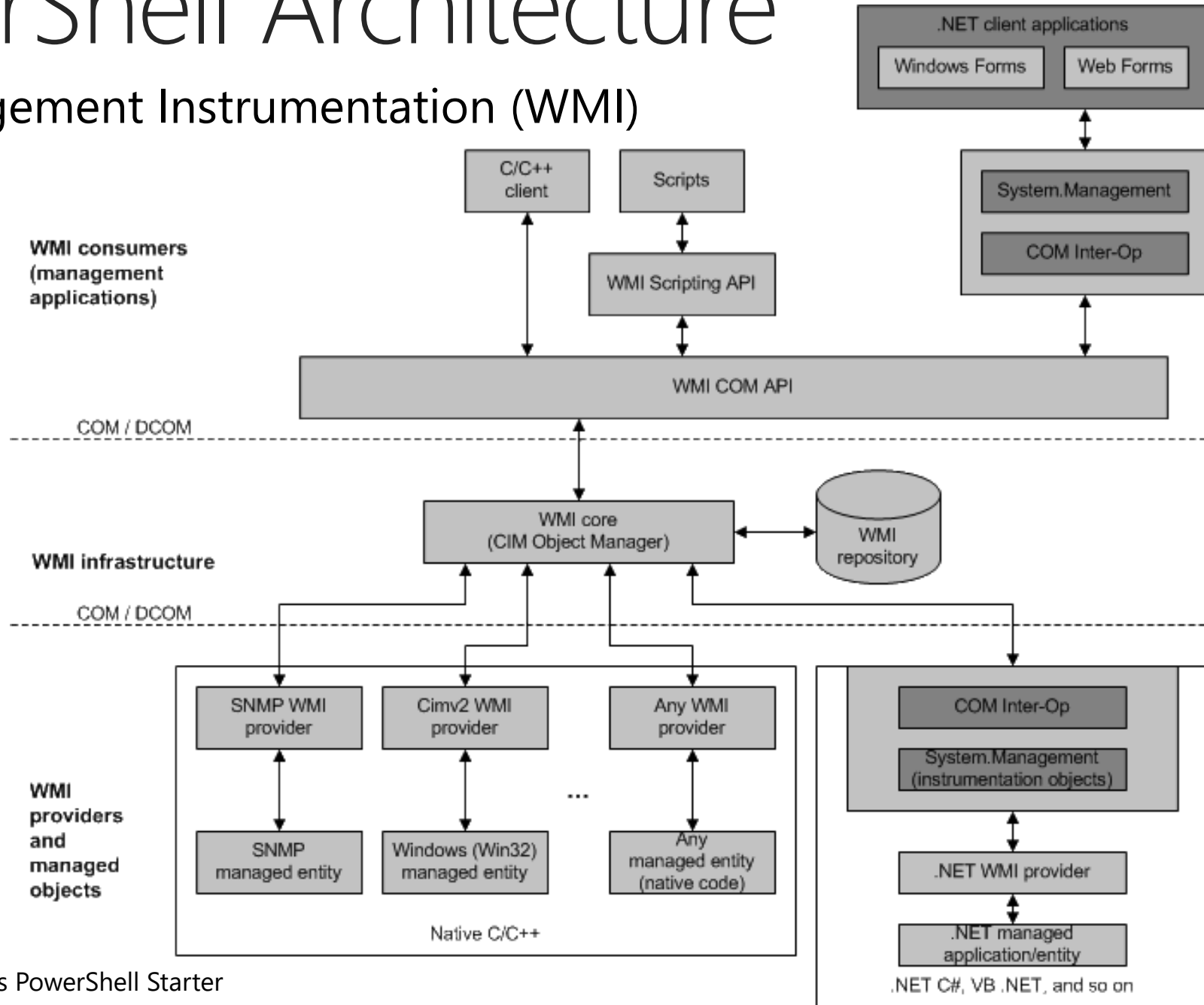
⊙ Windows PowerShell® is a task-based command-line shell and scripting language designed especially for system administration. Built on the .NET Framework, Windows PowerShell helps IT professionals and power users control and automate the administration of the Windows operating system and applications that run on Windows.



Microsoft
Azure

> PowerShell Architecture

Windows Management Instrumentation (WMI)



Windows Management Framework (WMF) 5.0

- Windows PowerShell
- Windows PowerShell Desired State Configuration (DSC)
- Windows PowerShell Integrated Script Environment (ISE)
- Windows Remote Management (WinRM)
- Windows Management Instrumentation (WMI)
- Windows PowerShell Web Services (Management OData IIS Extension)
- Software Inventory Logging (SIL)
- Server Manager CIM Provider

Windows Server 2012 and R2, Windows Server 2008 SP1 and R2, Windows 8 and 8.1,
Windows 7 SP1

Windows Management Framework (WMF) 5.1

- Require the .Net Framework 4.5.2
- New cmdlets example local users and groups (Get-ComputerInfo)
- PackageManagement added support for Containers, CBS Setup, EXE-based setup, CAB packages
- Security enhancements including enforcement

Windows Server 2016, Windows Server 2012 and R2, Windows Server 2008 R2, Windows 10, Windows 8 and 8.1,
Windows 7 SP1

| | WMF 2.0 | WMF 3.0 | WMF 4.0 | WMF 5.0 | WMF 5.1 |
|-------------------------------|---------|--------------------------|---------|---------|---------|
| Windows XP | SIM | NÃO | NÃO | NÃO | NÃO |
| Windows Server 2003 | SIM | NÃO | NÃO | NÃO | NÃO |
| Windows Vista | SIM | NÃO | NÃO | NÃO | NÃO |
| Windows 7 SP1 | SIM | SIM | SIM | SIM | SIM |
| Windows Server 2008 SP2 | SIM | SIM (Expecto IA64) | NÃO | NÃO | NÃO |
| Windows Server 2008 R2 SP1 | SIM | SIM (Expecto IA64) | SIM | SIM | SIM |
| Windows 8 | SIM | SIM | SIM | SIM | SIM |
| Windows 8.1 | SIM | SIM | SIM | SIM | SIM |
| Windows Server 2012 SP1 | SIM | SIM | SIM | SIM | SIM |
| Windows Server 2012 R2 | SIM | SIM | SIM | SIM | SIM |
| Windows 10 | SIM | SIM | SIM | SIM | SIM |
| Windows Server 2016 | SIM | SIM | SIM | SIM | SIM |

View PowerShell Version
\$PSVersionTable.PSVersion

Windows 10 version 1607 (Compilacion 14393.953)

C:\WINDOWS\system32\cmd.exe - powershell

```
C:\>powershell
Windows PowerShell
Copyright (C) 2016 Microsoft Corporation. All rights reserved.

PS C:\> $PSVersionTable.PSVersion
```

| Major | Minor | Build | Revision |
|-------|-------|-------|----------|
| 5 | 1 | 14393 | 953 |

```
PS C:\> $PSVersionTable
```

| Name | Value |
|---------------------------|-------------------------|
| PSVersion | 5.1.14393.953 |
| PSEdition | Desktop |
| PSCompatibleVersions | {1.0, 2.0, 3.0, 4.0...} |
| BuildVersion | 10.0.14393.953 |
| CLRVersion | 4.0.30319.42000 |
| WSManStackVersion | 3.0 |
| PSRemotingProtocolVersion | 2.3 |
| SerializationVersion | 1.1.0.1 |

> What are Cmdlets ?

- PowerShell Commands are called Cmdlets
 - Is pronounced command-let (not CMD-let)
- Gets all commands
 - Get-Command -Name <>
- Cmdlet Parameters
 - Authentication
 - Request
 - Session
 - Cmdlet
- Can use Unix commands
- Alias
 - Get-Alias
- Help / Manual
 - Get-Help / man

Get-command | where name -Like "*azurerm*sql*" | Get-Help | Format-Table Name, Synopsis -AutoSize

```
PS C:\Users\tigru> Get-command | where name -Like "*azurerm*sql*" | Get-Help | Format-Table Name, Synopsis -AutoSize
```

| Name | Synopsis |
|---|--|
| Get-AzureRmSqlServerAuditingPolicy | Gets the auditing policy of a SQL server. |
| New-AzureVMSqlServerAutoBackupConfig | Creates a configuration object for SQL Server automatic backup. |
| New-AzureVMSqlServerAutoPatchingConfig | Creates a configuration object for automatic patching on a virtual machine. |
| New-AzureVMSqlServerKeyVaultCredentialConfig | Creates a configuration object for SQL server key vault credential on a virtual machine. |
| Remove-AzureRmSqlServerAuditing | Removes the auditing of a SQL server. |
| Set-AzureRmSqlServerAuditingPolicy | Changes the auditing policy of a SQL Database server. |
| Use-AzureRmSqlServerAuditingPolicy | Specifies that a database uses the auditing policy of its host server. |
| Add-AzureRmSqlDatabaseToFailoverGroup | {{Fill in the Synopsis}} |
| Add-AzureRmSqlServerKeyVaultKey | Adds a Key Vault key to a SQL server. |
| Get-AzureRmSqlCapability | Gets SQL Database capabilities for the current subscription. |
| Get-AzureRmSqlDatabase | Gets one or more databases. |
| Get-AzureRmSqlDatabaseActivity | Gets the status of moving elastic databases. |
| Get-AzureRmSqlDatabaseAdvisor | Gets one or more Advisors for an Azure SQL Database. |
| Get-AzureRmSqlDatabaseAuditingPolicy | Gets the auditing policy of a database. |
| Get-AzureRmSqlDatabaseBackupLongTermRetentionPolicy | Gets a database long term retention policy. |
| Get-AzureRmSqlDatabaseDataMaskingPolicy | Gets the data masking policy for a database. |
| Get-AzureRmSqlDatabaseDataMaskingRule | Gets the data masking rules from a database. |
| Get-AzureRmSqlDatabaseExpanded | Gets a database and its expanded property values. |
| Get-AzureRmSqlDatabaseFailoverGroup | {{Fill in the Synopsis}} |
| Get-AzureRmSqlDatabaseGeoBackup | Gets a geo-redundant backup of a database. |
| Get-AzureRmSqlDatabaseGeoBackupPolicy | Gets a database geo backup policy. |
| Get-AzureRmSqlDatabaseImportExportStatus | Gets the details of an import or export of an Azure SQL Database. |
| Get-AzureRmSqlDatabaseIndexRecommendations | Gets the recommended index operations for a server or database. |
| Get-AzureRmSqlDatabaseRecommendedAction | Gets one or more recommended actions for an Azure SQL Database Advisor. |
| Get-AzureRmSqlDatabaseReplicationLink | Gets the geo-replication links between an Azure SQL Database and a resource group or SQL Server. |

> Variables

Naming

- ⊙ Correct : `$variable` ; `$VARIABLE` ; `$VaRiAbLE` ; `$Variable1`
- ⊙ Incorrect : `$v-1` ; `$v 1`

Text

- ⊙ [byte] 8-bit unsigned character
- ⊙ [char] 16-bit character
- ⊙ [string] Fixed-length string of Unicode characters

Number

- ⊙ [int] 32-bit signed integer
- ⊙ [long] 64-bit signed integer
- ⊙ [single] Single-precision 32-bit floating point number
- ⊙ [double] Double-precision 64-bit floating point number
- ⊙ [decimal] A 128-bit decimal

Others

- ➔ [bool] Boolean True/False value
- ➔ [DateTime] Date and Time
- ➔ [TimeSpan] Time interval
- ➔ [Guid] Globally unique 32-byte identifier
- ➔ [HashTable] Hash table, collection of key-value pairs
- ➔ [Regex] Regular expression

Cmdlets

- ➔ View all variables: 'Get-ChildItem variable:'
- ➔ View only system variables: 'Get-ChildItem env:'
- ➔ Remove variable: Remove-Variable -Name <variable name without \$>

> Statements and Operators

Statements

- ⊙ If , else
- ⊙ Switch
- ⊙ Do , while
- ⊙ For
- ⊙ ForEach
- ⊙ While

Operators

- ⊙ Equal to : -eq
- ⊙ Not equal to: -ne
- ⊙ Greater-than: -gt
- ⊙ Greater-than or equal to: -ge
- ⊙ Less-than: -lt
- ⊙ Less-than or equal to: -le
- ⊙ Match: -like
- ⊙ Does not match: -notlike
- ⊙ Matches a string: -match
- ⊙ Does not match a string: -notmatch
- ⊙ Containment (Boolean): -contains
- ⊙ Does not containment (Boolean): -notcontains
- ⊙ In operator (Boolean) : -in
- ⊙ Does not in operator (Boolean) -notin
- ⊙ Replace : -replace

> Functions

```
function [<scope:>]<name> [[<type>]$parameter1[,<type>$parameter2]]
{
    param(<type>$parameter1 [,<type>$parameter2])
    dynamicparam {<statement list>}
    begin {<statement list>}
    process {<statement list>}
    end {<statement list>}
}
```

```
1 function Get-OS()
2 {
3     [System.Environment]::OSVersion
4 }
5
```

```
<
PS C:\> Get-OS

Platform ServicePack Version          VersionString
-----
Win32NT           10.0.14393.0 Microsoft Windows NT 10.0.14393.0

PS C:\> |
```

> Modules

A *module* is a set of related Windows PowerShell functionalities, grouped together as a convenient unit (usually saved in a single directory)

Cmdlets

- ➔ Search modules: Find-Module <module name>
- ➔ Install Module: Install-Module <module name>

```
C:\>powershell Set-ExecutionPolicy RemoteSigned

Installing package 'AzureRM'
  Installing dependent package 'Azure.Storage'
  [
    Installing package 'Azure.Storage'
    Downloaded 3.72 MB out of 5.30 MB.
    [ooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooo]
  ]

You are installing the modules from an untrusted repository. If you trust this repository, change its InstallationPolicy value by running the Set-PSRepository cmdlet.
Are you sure you want to install the modules from 'PSGallery'?
[Y] Yes [A] Yes to All [N] No [L] No to All [S] Suspend [?] Help (default is "N"): A
```

- ➔ Import Module: Import-Module <module name>
- ➔ Uninstall Module : Uninstall-Module <module name>

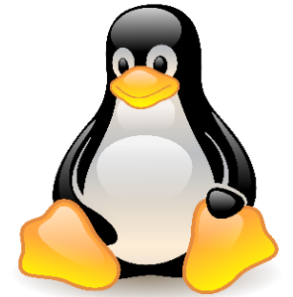
➤ Great Things

- Open-Source (<https://github.com/powershell>)
- Editors
- Intellisense
- ISE Resources and Modules
- Remoting
- Automomoation
- PowerShell Desired State Configuration in Windows and Linux
- Can run in Linux (some distros) and Mac OSX support.

> Install PowerShell on Linux

➔ Get the files!

➔ <https://github.com/PowerShell/PowerShell/releases>



➔ RedHat family (RHEL, CentOS, etc.)

➔ Download "`*centos.x86_64.rpm`"

➔ "`yum install /path/to/*.rpm`"

➔ Pre-requisites installed automatically (7.2 anyway)

➔ Debian family (Debian, Ubuntu, etc.)

➔ Version dependent pre-requisites!

➔ Ubuntu 16.* [or 14.*]:

➔ "`sudo apt-get install libunwind8 libicu55`" [or "`libicu52`"]

➔ "`sudo dpkg -i /path/to/*.deb`"

```
you need to be root to perform this command.
[root@ ~]# sudo -s
[root@ ~]# dir
powershell-6.0.0_alpha.9-1.el7.centos.x86_64.rpm
[root@ ~]# yum install powershell-6.0.0_alpha.9-1.el7.centos.x86_64.rpm
Loaded plugins: fastestmirror, langpacks
Repondata is over 2 weeks old. Install yum-cron? Or run: yum makecache fast
Examining powershell-6.0.0_alpha.9-1.el7.centos.x86_64.rpm: powershell-6.0.0_alpha.9-1.x86_64
Marking powershell-6.0.0_alpha.9-1.el7.centos.x86_64.rpm to be installed
Resolving Dependencies
--> Running transaction check
---> Package powershell.x86_64 0:6.0.0_alpha.9-1 will be installed
--> Processing Dependency: libunwind for package: powershell-6.0.0_alpha.9-1.x86_64
base                                     | 3.6 kB  00:00:00
extras                                  | 3.4 kB  00:00:00
openlogics                              | 1.3 kB  00:00:00
updates                                 | 3.4 kB  00:00:00
(1/3): openlogics/7/x86_64/primary       | 9.6 kB  00:00:00
(2/3): extras/7/x86_64/primary_db       | 160 kB  00:00:00
(3/3): updates/7/x86_64/primary_db     | 6.4 MB  00:00:00
Determining fastest mirrors
openlogics                               | 48/48
--> Processing Dependency: libicu for package: powershell-6.0.0_alpha.9-1.x86_64
--> Running transaction check
---> Package libicu.x86_64 0:50.1.2-15.el7 will be installed
---> Package libunwind.x86_64 2:1.1-5.el7_2.2 will be installed
--> Finished Dependency Resolution

Dependencies Resolved

=====
Package                Arch          Version           Repository          Size
=====
Installing:
powershell             x86_64        6.0.0_alpha.9-1  /powershell-6.0.0_alpha.9-1.el7.centos.x86_64 121 M
Installing for dependencies:
libicu                 x86_64        50.1.2-15.el7    base                6.9 M
libunwind              x86_64        2:1.1-5.el7_2.2 updates            56 k
=====
Transaction Summary
=====
Install 1 Package (+2 Dependent packages)

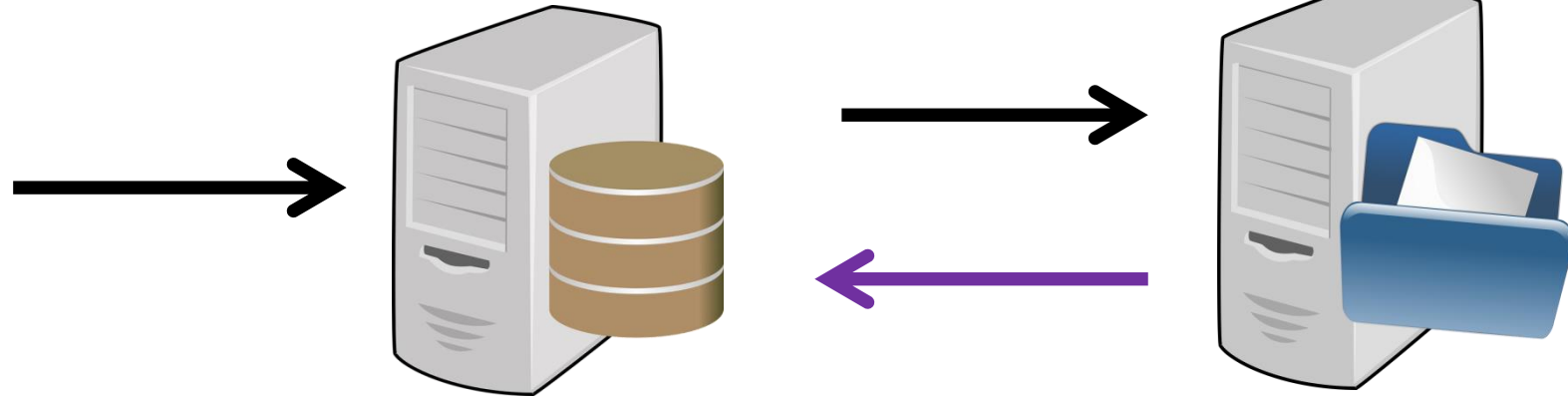
Total size: 128 M
Total download size: 6.9 M
Installed size: 145 M
Is this ok [y/d/N]:
```



Stop talking and run PowerShell !!!
We want action.

> Windows PowerShell Desired State Configuration (DSC)

```
- response: [
- group: [
- type: "place",
- name: "Matching Places",
- items: [
- id: "IndiraGandhiInternationalAirport",
- name: "Indira Gandhi International Airport (DEL)",
- parent: [ ],
- location: {
- address: "Indira Gandhi International Airport",
- city: "New Delhi",
- state: "India",
- lat: 28.56482261616,
- lng: 77.30980234299,
- distanc: 12291
- },
- categories: [
- id: "Airports",
- name: "Airports",
- placeName: "Airports",
- locn: "https://www.openstreetmap.org/data/relations/terminal-airport-ana",
- parents: [
- "Travel Spots"
- ],
- primary: true
- },
- id: "AirportTerminal",
- name: "Airport Terminal",
- placeName: "Airport Terminal",
- locn: "https://www.openstreetmap.org/data/relations/terminal-airport-terminal-ana",
- parents: [
- "Travel Spots",
- "Airports"
- ]
- ],
- verified: true,
- status: {
- checkinCount: 3728,
- userCount: 1338
- },
- hours: {
- count: 0
- },
- ],
- id: "GurgaonDelhiTollGate",
- name: "Gurgaon Delhi Toll Gate",
```



> Questions & Answers



Image source: <http://dilbert.com/strip/2011-05-11>



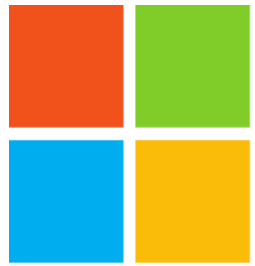
Image source: <http://dilbert.com/strip/2010-07-08>



> Get-ProgramarSartuday -NextSessions

| | | | |
|-------------|---|---|--|
| 13:15 | Event.Suspend ("Almoço Livre") | | |
| Sala | Azure B | .Net | MSDN |
| 14:30 | "Top Secret Security Session" António C.Santos | Workshop CoderDojo LX (normal) [Info e inscrições] | Workshop CoderDojo LX (Scratch) [Info e inscrições] |
| 15:10 | "As novidades do C# 7" Paulo Morgado | | |
| 16:00 | Event.Break () | | |
| 16:20 | "WebRTC: Muito mais do que «talking heads»" Rui Ribeiro | | |
| 17:00 | "TI não é apenas para IT PROs" Ask the Experts | | |
| 17:30 | "From Sensor to Dashboard: How to does IoT data travel?" Pedro Rosa | | |
| 18:20 | Sorteio (*) e encerramento | | |
| 19:00 | Event.Extend ("Jantar", ExtType.Optional) | | |

> e.Sponsors.ApplyThanks ()



Microsoft



Rumos



main
hub_



Lunar Cat

survs 
asking for you

THANK YOU!
OBRIGADO!



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