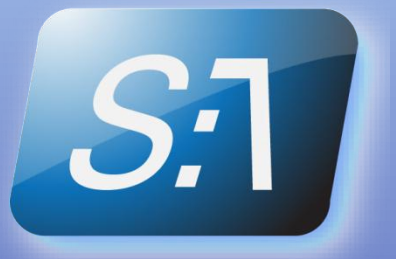


Remoting in the Real World

Enable-Scale | Use-Remoting

James Brundage
President, Start-Automating

Get-PowerShell

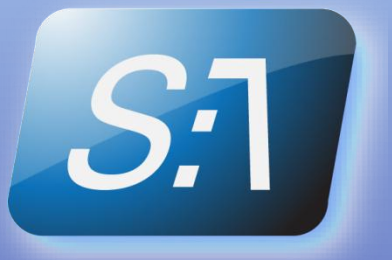
PowerShell is the World's Best Scripting Language

- Find out how to use things with Get-Help
- Cmdlets help you do complex Tasks in simple scripts
- Providers allow you to interact with any hierarchy
- Old Command Line Programs can be brought into the mix
- All of VBScript's COM is yours to use
- Everything in WMI is easy to access
- Leverage the full Power of .NET
- Easily interact with Web Services (SOAP or REST)
- Compile what you can't use directly (with Add-Type)
- Tons of incredible community modules
- … and the Object Pipeline lets you bring it all together

Show-Background

A Brief Example of Why You Need Remoting

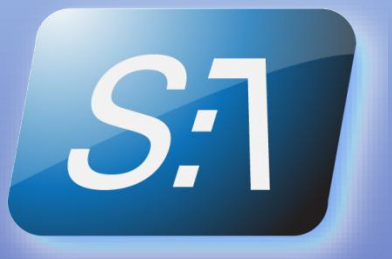
- Big Businesses now know that PowerShell is the way
- Big Businesses have Big Infrastructure demands
- Big Businesses have a lot of different techs to work with
- PowerShell is the path to bring them all together
- Let’s take a look at a single case



Get-Help about_SharePoint_Online

What one client needed

- Start-Automating does a lot of work with Microsoft
- SharePoint Online needed to make test deployment quality
- Validations included:
  - HyperV checks
  - User configuration
  - Network configuration
  - Registry Checks
  - SQL Configuration
  - SharePoint settings
  - Internal quality gates and web services
- And for fun…
- A network with REALLY complex trust relationships
- **PowerShell Is the Only Way**

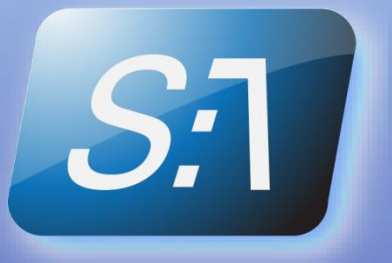


Get-Remoting

What Remoting Does for You

- Everything in PoweShellV2 can be done Remotely*
- Learn how to do it here, use it everywhere.
- Connect to a single box for an interactive experience
- Jobs let you run long tasks in the background
- Persistent Sessions let you avoid reconnecting
- Custom Endpoints let you expose capabilities securely**

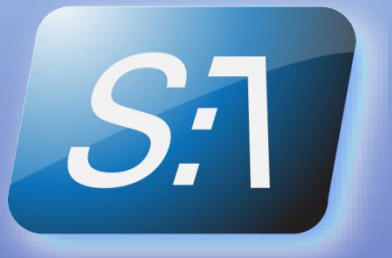
- * (some incredibly specialized knowledge required)
- ** (if you’re a PowerShell Ninja)



Get-Catch

What's the "Almost?"

- No files
- No variables
- No local modules
- Not a single luxury
- Need PowerShell V2 on all boxes
- No methods, once you bring the job back
- Objects brought across remoting work differently locally
- Some remoting requires interacting with Custom Endpoints



Get-Remoting -Other

Other Ways You Can Collect Information

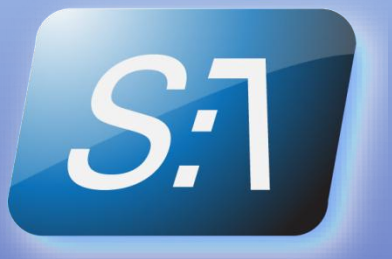
- Because Powershell is superglue, almost any other remoting works too
- Cmdlets with alternatives to PowerShell remoting:
  - WMI Remoting (Get-WmiObject –ComputerName)
  - Performance Counters (Get-Counter –ComputerName)
  - Event Logs (Get-WinEvent –ComputerName / -ComputerName)
- Other alternatives
  - SSH/Telnet/SNMP (/nSoftware)
  - Web Services

Compare-Approach

How to decide what types of remoting to use

- Some situations are a clearly one case or another
- If you have a lot of legacy systems (and can't upgrade)…
- … you're stuck with Get-WmiObject and web services
- If you have to interact with Exchange or SharePoint 2010…
- If you need object fidelity…
- If you are watching your internal ports like a hawk…
- If you need impersonation…
- If you need asynchronous remoting…
- … V2 remoting is the only way

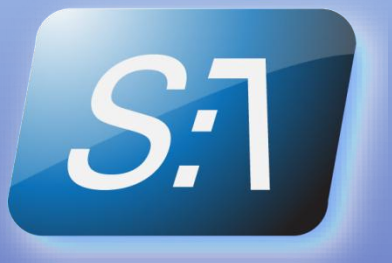
- But most Cases require a mix of techniques



Get-Solution

Save-Time | Save-Money | Start-Automating

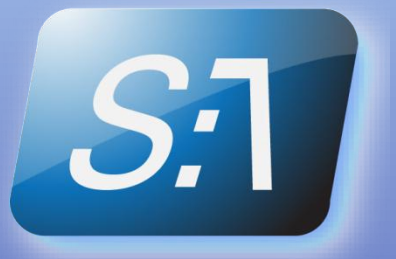
- PowerShell can collect enough information to solve the problem
- Collecting “the right way” lets you build the system piecemeal
- All data collected had just one thing in common:
  - A ComputerName
- The environment could be any size, with any number of servers
- We needed to create a way to collect information uniformly
- PowerShell is the framework



Show-Checklist

Running Up That Hill

- Data can be collected from many data sources
- Data collected can be validated in a uniform way
- Without reconnecting to the resource
- Scale to collect data from N computers
- Easy for others to extend later on
- Display information collected in an “actionable” way
- Fault tolerant
- Can run validations piecemeal
- Loosely coupled (few dependencies)

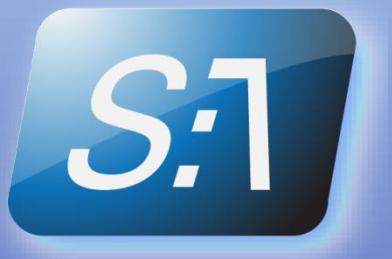


Start-Simple

Develop Locally, Reuse Globally

- Everything Local Can Be Done Remotely (Almost)
- Start with just one command: Invoke-Command
- Invoke-Command takes a ScriptBlock, and runs that ScriptBlock on the remote machine
- Try it out locally…
- …Then use Invoke-Command –ScriptBlock {} to run remotely

- If you're using WMI or other native remoting…
  - Use Get-WmiObject or Get-Counter locally first



Start-Scaling | Use-Jobs

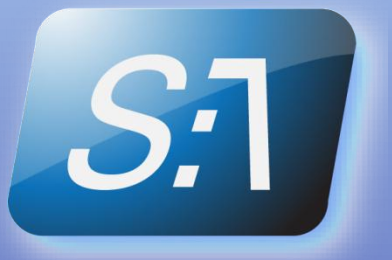
Scaling Solutions with Jobs

- Going to N computers in sequence does not scale
- Background jobs are new for V2
- Start-Job will create local jobs
- Commands with the –AsJob switch can work in the background
  - Inluding…
    - Invoke-Command
    - Get-WmiObject
- You can wait for completion with Wait-Job
- You can get the results of a job with Receive-Job

Start-Scaling | Use-PSSession

Save-Time | Stop-Reconnecting | Use-PSSessions

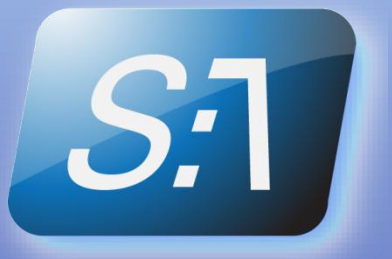
- Connect/Disconnect is slow
- Invoke-Command –ComputerName will always create new sesssions
- To avoid this, use New-PSSession
- New-PSSession also enables session options:
  - New-PSSession -SessionOption (New-PSSessionOption…)
  - -NoMachineProfile avoids user profile creation
  - -IdleTimeout lets you stay connected and idle
  - -OpenTimeout lets you connect to high latency boxes
  - -NoEncryption lets you monitor the packets*
- *If you’re into that sort of thing



Enter-RemoteDataCollector

What's wrong with starting simple

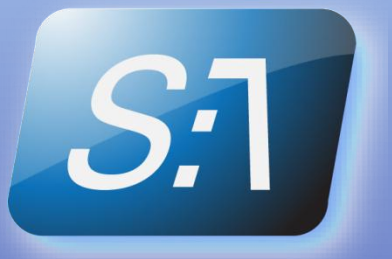
- The SharePoint problem is easy to solve poorly
- It's tempting to collect and validate information at once
- But the devil is in the details:
  - The code is reusable
  - The code becomes strongly coupled
  - Eventually, a need from Invoke-Command will show up
  - … like CredSSP



Show-Pain

What CredSSP is, And Why you need it

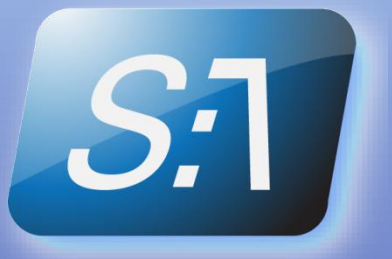
- Remember: Beware of the 2nd Hop
- Some hops you can control
  - \\server\share is a simple example
- Others you can't
  - Many things in WMI need to connect remotely to get info
  - SharePoint Commands are "Special"*
- WMI 2nd hops will quickly fail, leaving you in a black hole
- If an IT admin finds out that WMI was hiding info from him, does he make a sound? (I know I did)



Show-SharePoint –is Special

What's So "Special" about the SharePoint Cmdlets

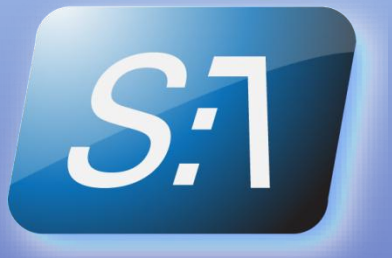
- The bad special:
  - SharePoint commands all implicitly do a 2nd hop
  - Unlike Exchange, nothing is done to make this road easy
  - SharePoint commands fail with a few very strange message
    - "No farm has been Selected"
    - "Farm does not exist"
    - "You do not have privileges to access the farm"
- The friggin amazing, awesome special
  - **Everything** can be collected from a one point in the farm



Show-Technique

What's a Remote Data Collector?

- The solution to the problem is to build a "Get" that looks/walks/talks like Invoke-Command or Get-WmiObject
- This Get only depends on built in commands
- Get returns the data as a flat, simplified property bag
- If possible, Gets should not have additional parameters
- It adds a type, so you can format the info
- You can write your own RemoteDataCollector, but it's much easier to generate them



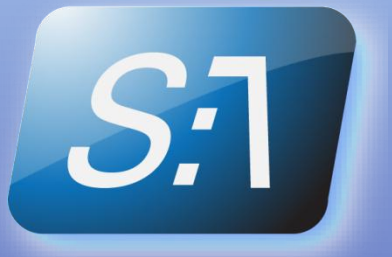
Show-Example

Let's Look at Some Complete Remote Data Collectors

Confirm-Lessons

What we've learned about remoting

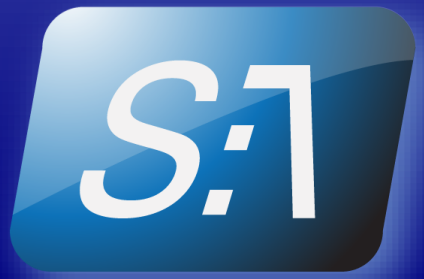
- Plan out where your needs are and use the right remoting for it
- Develop locally with the cmdlets
- Wrap the local script in a remote data collector
- Make sure you create long term sessions with New-PSSession
- Make sure you use Jobs to scale
- Switch to CredSSP early
- Remote Data Collectors are a useful way to do all of this
- Scripts are out there to help you write them
  - In this slide deck
  - In Sparkplug (http://sparkplug.start-automating.com/)
  - On our blog (http://blog.start-automating.com/)



Send-Feedback –and Questions

Remoting is a Deep Rabbit Hole… Don't Go Down It Alone

- Code In This Slide!
- Courseware is Coming!
- Please, feel free to contact us before you get lost
- General Info & Requests for Training:
  - info@start-automating.com
- Personal Email
  - James.Brundage@Start-Automating.com
- Hope this Helps



Start Automating

Stop-Presentation | Start-Q&A

Any Questions?