PowerShell 2.0 Remoting

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About me

- Lead engineer in SharePoint solutions team at Dell
- Moderator on the MS Scripting Guys Forum
- Developer on
  ◦ PSCodePlex
  ◦ PSRemoteFileExplorer
  ◦ PSSP2010Utils
  ◦ PSISECream
  ◦ Remote File Explorer PowerPack
  ◦ BITS File Transfer PowerPack
- Author of
  ◦ Free eBook - Layman's guide to PowerShell 2.0 remoting
  ◦ Co-author: Quest's SharePoint 2010 & PowerShell cheat sheet
  ◦ PowerShell essentials for SharePoint 2010 Administration – Sybex Publications (Coming soon)
- Blog at http://www.ravichaganti.com/blog

Agenda

- ▸ Traditional Remoting
- ▸ PowerShell Remoting
- ▸ The basics
- ▸ Interactive Remoting
- ▸ Implicit remoting
- ▸ On-disk remote sessions
- ▸ Multi-hop remoting
- ▸ Session configurations
- ▸ Learning resources
- ▸ Q & A

Traditional Remoting

- Known as classic remote access
- PowerShell is not involved in this
  - Remote access is implemented by cmdlets
  - For example, Get-Service, Get-Process, etc
- Uses RPC, COM, DCOM, and etc
- Limitations
  - Inconsistent implementation
  - Not all cmdlets implement remoting

PowerShell remoting

- Built on top of WinRM
- Enables Universal Code Execution Model (UCEM)
- Remoting requirements
  - Windows PowerShell 2.0
  - NET framework 2.0 SP1 or later
  - Windows Remote Management (WinRM) 2.0
- Remoting methods
  - Interactive (1:1)
  - Fan-out (1:Many)
  - Fan-in (Many:1)

The basics

- Enable remoting
  - Enable-PSRemoting
  - Must be at an elevated prompt and administrator privileges
  - Remoting to workgroup computers requires setting trusted hosts
    - Set-item wsman:localhost\client\trustedhosts -value *
- Running remote commands
  - To run remote commands, user should
    - Be a member of the administrators group on the remote machine
    - Be able to provide administrator credentials at the time of remote execution
  - Invoke-Command
  - Enter-PSSession
  - Import-PSSession

Invoke-Command

- Opens a remote session and executes the command
- Can execute a scriptblock (-ScriptBlock) and also a script (-FilePath)
- Supports persistent sessions (-Session)
  - Create one using New-PSSession
- Enables ability run remote commands as jobs
- Limitations
  - No tab completion for remote commands
  - Can be painful to use Invoke-Command again & again

Interactive remoting

- SSH/telnet kinda experience
- Enter-PSSession enables interactive remoting
- Supports persistent sessions (-Session)
- Exit using Exit-PSSession
- Limitations
  - Only one remote session at a time

Implicit remoting

- Imports a remote session to local system
- No limit on how many sessions you can import
- Name conflicts can occur
  - Imported cmdlets hide or override the local cmdlets
  - Aliases are an exception (understand command precedence)
- Limitations
  - Remote cmdlets won't be available
    - After exiting PS console
    - Session is broken
   - Session is removed (Remove-PSSession)

On disk remote sessions

- ▸ Remote session can be saved as an on disk module

- ▸ Export-PSSession saves the remote session to module on disk

- ▸ Can be loaded as a PowerShell module
  - ◦ Ipmo <Module File Name>

- ▸ May need to extend memory limits for remote sessions
  - ◦ Set-Item WSMan:\localhost\Shell\MaxMemoryPerShellMB 1000

Session Configurations

- Session configurations define
  - Who can create a Windows PowerShell session on the local computer
  - What level of access — to cmdlets, scripts and PowerShell language — they have on the local computer, etc.
  - StartupScripts can be used to pre-load modules/snapins
  - Get-PSSessionConfiguration to list configuration names
- Can be customized
  - Register-PSSessionConfiguration
- Benefits
  - customize the remoting experience for users by restricting what is available
  - delegate administration

Fan-in remoting

▸ Use IIS to host PowerShell sessions
▸ Enables many:1 remoting
▸ Good for hosted services
▸ Example: Quest's MobileShell
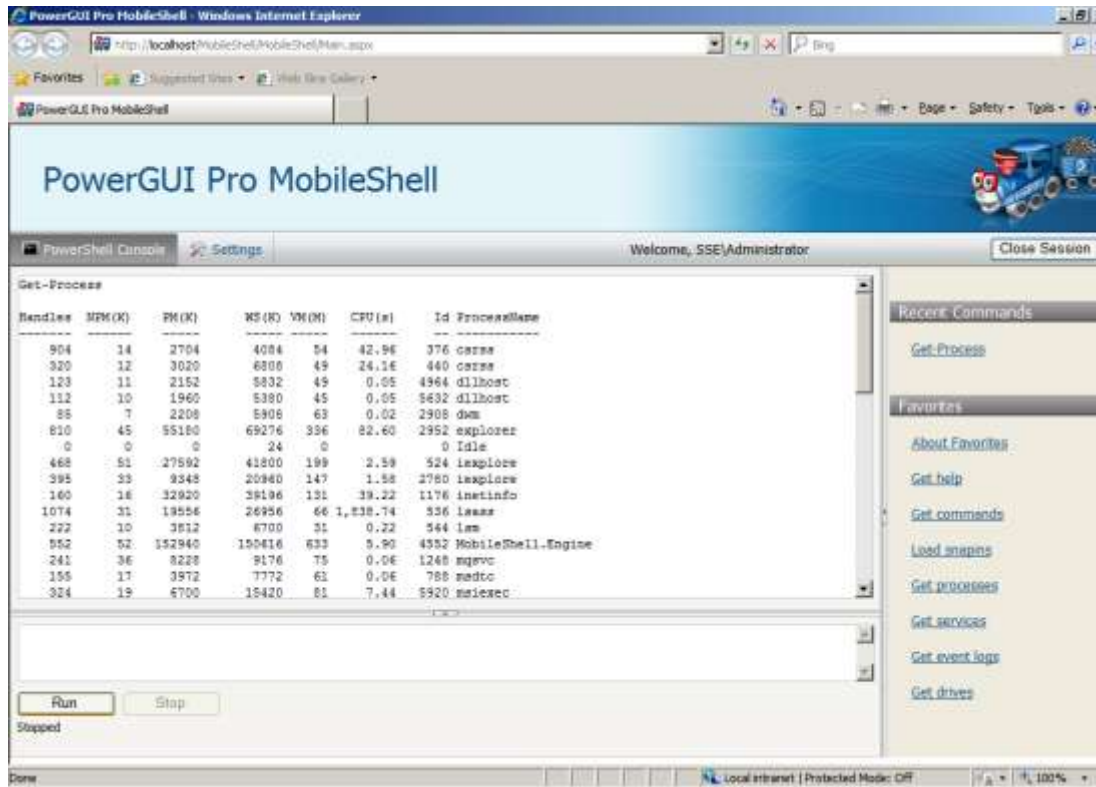
Learning resources

▸ PowerShell
  ◦ Getting started guide
  ◦ PowerShell Learning center
  ◦ The scripting Guys blog
  ◦ PowerScripting Podcast
  ◦ @PSBUG on Twitter
  ◦ PowerShell.com free online eBook

▸ Remoting
  ◦ Layman's guide to PowerShell 2.0 Remoting
    http://www.ravichaganti.com/blog/?p=1305
  ◦ Administrator's guide to PowerShell remoting
    http://powershell.com/cs/media/p/4908.aspx

Q & A