Building a SQL Server Test Lab

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What makes a full SQL Server Lab Useful

• An installation nightmare on one system
• Error prone shared features and files
• Multiple versions, builds, and editions
• Testing unique installations
• Testing Security, Network, Domain, Cross Environments
Agenda

• Decisions on Virtual Technology
  • Hyper-V
  • VMWare
  • VHD
  • Cost Associations

• Speed Testing

• Storage

• Fundamental requirements of your lab
  • Network
  • Domain
  • Storage Server
  • Security
  • Licensing – We don’t need no stinking...
Decisions, decisions...

• How much money do you have
  • VMWare Workstation is around $250
  • Client Hyper-V
    • Windows 8 Pro
    • Windows 7 – Upgrade to Windows 8 Pro or VMWare

• Can your laptop/desktop handle this?
  • Memory is cheap so why do you have 4GB
  • Disk is cheap but can a laptop take more
  • Allocate around 25% to 30% to your virtual lab when it is running

• Ease of installation and use
  • Windows 8 Pro? Hyper-V installation is a feature on tick away
  • Hyper-V is a bit more “configuration needy”
  • VMWare Workstation
  • VMWare out of the box runs with little to no configuration other than, create VM

• Do you intend to share virtual machines?
  • Consultant, FTE, Geek in a garage
Cost

- VMWare Workstation around $250
- SQL Server Developer around $50
- Windows Server 2012 Evaluation for 180 Days
- Possible Disk, Memory Upgrade Needs
  - You are ready to go...

All of these are feasible and much room for company expenses based on how you sell the need
VMWare battles with Hyper-V Decisions

- What really is our need?
  - Setting up a SQL Server lab, not learning virtualization
  - Purchase, install, configure what will be efficient
- Both will suck the life out of your machine
- Both will require more disk
- Did I mention Windows Server is not free?
- Yes, SQL Server does not come with it either
- On Windows 8 Pro? No brainer, Hyper-V
- Can’t have both
- Did someone say, Cloud?
• Completely Capable Resources
  • Full Windows Server Installation Support
  • Full SQL Server Feature-set Support
  • Cost associated in bandwidth more than anything
  • Evaluation in Azure is greatly increased now
  • Performance variations do apply – Metal and Cloud are not the same
  • Disk Configurations
  • Core Count
  • Memory Usage
  • Shared Areas
Speed, performance, I/O, Memory...

- Speed is a critical factor to calculate
  - Testing on a virtual lab <> Server infrastructure
  - Laptop <> DL580
  - Calculate a base formulation for a “Best Estimate”

\[
\frac{4\text{MB}}{2048\text{ MB}} = \frac{X}{65536\text{ MB}}
\]
Who wants a mini-NAS?

- Seriously, mini/portable SAN/NAS devices are useful
- External Drives
- Utilizing the ROM bay
  - Who really uses CD/DVDs any more?
- Laptop upgrade
  - Multiple bays
- SSD vs. SATA
Fundamental Needs

Complete Solution

- Active Directory
- DNS
- Storage Services
- SQL Server
  - Features
  - Failover
What’s first?

• Things have to go in order
  • Domain Controller VM
  • DC – Configure Active Directory
  • DC – Configure DNS
  • DC – Configure Storage Services and Shares
  • Snapshot – Clone
  • Create Windows Server 2012 VM
    • Feature installations (.NET etc...), Patch, hotfix, Security, Configure
  • Snapshot – Clone
  • Copy Windows Server 2012 VM Clone x 2
  • Install SQL Server 2012, patch, configure
  • Snapshot – Clone
  • Install SQL Server 2012, patch, configure
Network – VMWare/Hyper-V

• Hyper-V requires you to create a virtual switch
  • After that, you are good enough

• VMWare will allow out-of-the-box type configurations
  • So you’re good from there

• Network configuration

• Complicated or Simplistic
  • Remember what the purpose is
  • Availability Group and multi-subnet testing
  • Internet access
• We’re not working at being an expert here
• Step one – install operating system...
  • OK, we’re better than that
• Step one – Windows Server 2012 makes this easy
  • Install Active Directory Domain Services and Group Policy Management
  • Add Domain Controller
  • Add Forest
  • Checkbox, Checkbox, Checkbox...DNS ← you don’t want to have to add this later
  • Don’t forget passwords and don’t write them under your laptop on a sticky note
  • Pick a meaningful NetBIOS name
    • ONPNT.TedsDomain.com
Windows Server VM Build

- Ensure you have your ISO ready
- Never bypass patching, SP level, Hotfixes
- Security – Do it right as easy as it is to do it wrong
- Decide between Server Core or GUI or Both
- I created my domain and a Windows Server but the Windows Server cannot see the domain...
  - Network. It’s always the network
  - IP Configuration is your quickest configuration to a happy end result
High Availability testing in your virtual lab
Never bypass patching, SP level, Hotfixes
Technology testing for SQL Server 2012/2014
Feature-set exposure
Capitalize on Windows Knowledge
Capitalize on quick VM builds to SQL Server configuration
First rule, don’t leave your VMs running all the time
Second rule, don’t leave your VMs running all the time
Think about the order of shutdown
  • Node 4
  • Node 3
  • Secondary in failover
  • Primary in failover
  • Domain is always last – we haven’t setup DC replication
Negatives vs. Positives

• Cons
  • Remember, it is a hard life for your laptop/desktop
  • Cost associated with it

• Pros
  • You can test just about everything on your own
  • You have a much less chance of affecting your host
  • You can start from scratch in minutes
  • Supporting multiple versions, editions and on different OS versions, Editions
You know you have a list of them