

Suggestion For Enhancing Performance For Microsoft SharePoint

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Abstract--Get field-tested best practices and confirmed techniques for designing, organizing, operational, improving and optimizing Microsoft Office SharePoint Server 2013. SharePoint, the fastest increasing product in Microsoft's history, is used to store quantities of documents, meaning solicitation performance is a key component for successful SharePoint deployment and embracing. It's experiential that people to proper planning for topology and install the servers suitable and appropriate but still they start facing unfortunate loading of SharePoint sites. This is mainly to say the poor attention taking of the servers. People think that once they install SharePoint with great configuration server topology so everything will smooth and fine. But that not case. SharePoint admin must need to pattern for database data size, server updates, antivirus apprise scanning etc. You will find out how to deploy the software, design your environment, manage content, analyse and view data, perform disaster recovery, monitor performance, and more. SharePoint sites that help your organization work in partnership, take advantage of business comprehensions, and improve productivity with practical discernments from the experts. Every time when we open SharePoint 2013 shows message that "Working on it" of course, SharePoint settings and configurations do impact your SharePoint's performance promptness. In SharePoint everything is stored in database. The SQL Server is the real engine behind SharePoint then all these thinks depends on SharePoint performance, the faster the information can be written, stored and edited from it then faster SharePoint Performance will be.

This paper covers requirements for improving SharePoint Performance to help you in getting your SharePoint environment effective properly.

Keywords--Database Sizing, Connection between WFE and SQL Server, Antivirus Software, Enable File stream for document Storage, Cache Enabling, and Large Lists.

I. INTRODUCTION

Microsoft SharePoint 2013 is an Enterprise Teamwork Platform which offers a wide range of cohesive solutions including Enterprise Content Management (ECM), Web Content Management (WCM), Enterprise Social Networking, Business process management (BPM), Business Intelligence (BI), Enterprise Search etc.

In an organization using SharePoint 2013 to create websites. SharePoint Server 2013 is intended to help you accomplish new levels of consistency and performance, delivering features and competencies that simplify administration, protect communications and information, and empower users while meeting their demands for greater business flexibility.

SharePoint is typically used in midsize businesses & large subdivisions.

The Hardware Requirements for SharePoint 2013 server are quite substantial. SharePoint 2013 performance issues have been accredited to lack of assets. Even if the organization at first meets performance expectations, increasing numbers of documents, groups, lists, and sites may increase page load times and decrease fulfilment. This paper enhancing SharePoint performance that inherit organizations environment expectations.

SharePoint trusts not only on the core SQL, IIS, and .NET mechanisms, but also on inter dependencies such as Active Directory, the network, SharePoint construction, and corporeal server hardware. This means a performance issue may have more than one root source, and similarly require making multiple changes for trickydetermination. Operational jobs, backup practices, and third-party tackles add more possible root origins to performance problems.

The SharePoint performance issues can be attributed to poor designs, insufficient memory, storage blockages, poorly assembled SQL queries, or sluggish page load times for integrated constituents. Server & Application Monitor provides wide-ranging monitoring for key pointers of SharePoint performance issues so administrators can isolate and fix harms before users notice performance concerns.

II. CAUSES OF SHAREPOINT PERFORMANCE

Following are some the identifiers that wants to be taken care for decent performance on any SharePoint ranch.

A very mutual slow problem is when SharePoint first get up. Since SharePoint is a .Net application running on IIS, the application pools essential to swirl up, assemble all of the assemblies and serve up pages. This can take a few minutes when SharePoint primarily starts up.

- **SharePoint Satisfied Database Performance**-Set the size of your satisfied database to something that signifies the size of the data you're going to upload. SQL Server, by default, is arranged to consume as much memory as possible. This can have a negative impact on the enactment of everything, even the operating system.
- **The Connection amongst WFE and SQL Server**-Use enthusiastic high-speed network between WFE and SQL servers. The SharePoint 2013 solicitation is built on the SQL Server database engine. Most content and settings in SQL Server 2012, SQL Server 2008 R2 with

Service Pack 1 (SP1), and SQL Server 2014 are stored in relational databases.

- **SharePoint Founded Antivirus Software Solutions-** The antivirus software that is running on these server which is scanning for each uploaded file and one more scanning while moving it to SharePoint then it will be tremendous usage of memory. Microsoft commends that customers arrange an antivirus solution based on the SharePoint Entry Server Virus Scanning Application Programming Interface (VS API). The SharePoint Entry Server product group is dedicated to providing developments to this API.
- **Permit File stream for document Packing-** All the files which are uploaded to SharePoint can be deposited on file stream in its place of directly in database tables
- **Cache Enabling-** Compression not allowed. Caching not enabled or not arranged. Huge pages. Unwaged SQL trips, underlying network issues could be the problem for slow page filling.
- **Exploiting List Performance-** Large lists >2,000–3,000 items in a level. No indexing on lists. Underlying SQL

Server matters. Too many columns is matter for SharePoint list. Creating huge list there are also some key Selections that you must make that can touch large list presentation. These include permissions, the amount of columns added to a list, the amount of lookup pillars in views, and the folders and indexes that are used to organize a list. Creating large list such as material architecture, performance, tragedy recovery, and supremacy.

Resolving Performance Issues

- Distinct temp and search databases in multiple files across high I/O disk volumes, growth RAM, use enthusiastic disks for transaction logs, defragment, and re-index databases broadsheet.
- Determination back-end bandwidth and response matters, position of objects properly, use 64-bit hardware or configure memory pool limits, delay downloading core.js

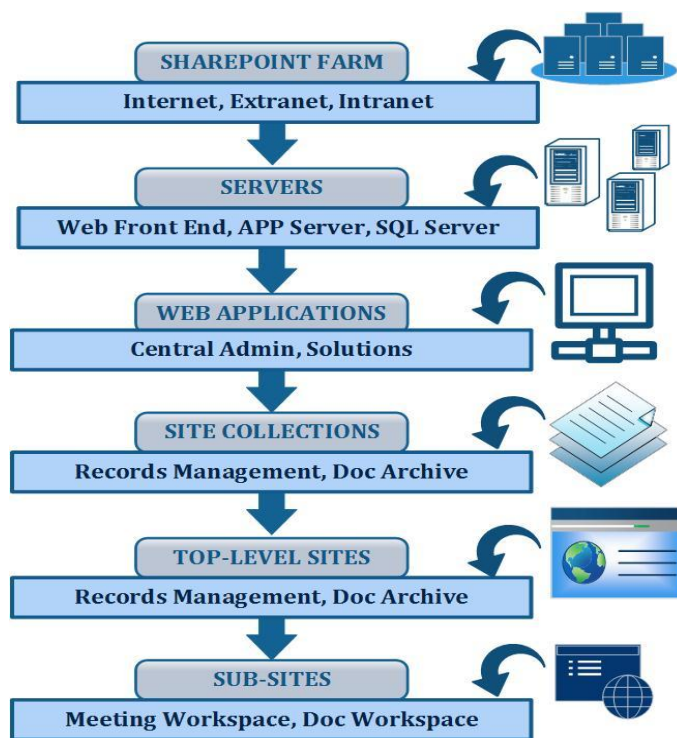


Fig. 1 SharePoint Mechanism Affecting Performance

III. SHAREPOINT ARCHITECTURE MECHANISMS

The SharePoint Presentation Inter dependencies that enclosed the SharePoint architecture and explained at a basic level how IIS, SQL Server, and .NET work together to reduce requested pages. **Figure. 1 SharePoint Architecture Mechanisms Affecting Performance** shows the key components that tell to optimization choices.

Irrespective of the framework and methodology you use in annoying to comprehend your SharePoint performance issues, isolate their root causes, and resolve the problems, you need starting point data that reflects satisfactory performance against which you compare data that reflects poor presentation. You can obtain a starting point set of performance data either right after your original deployment, during periods of satisfactory performance, or from best-practice references. Efforts to optimize SharePoint performance will be navigating through the many configuration options that the fundamental IIS, SQL Server, and .NET technologies provide during the preparation and design stages, as well as in hands-on process

Following Issues will cover in SharePoint Architecture Mechanisms

- High disk I/O action on SQL Server
- Extended time to load full page
- Deprived list performance
- IIS out of memory circumstances
- Index on one or more columns, safeguard SQL Server performance, and save fewer than 2,000–3,000 items in a level. Use IIS overlapped recycling, use 64-bit hardware.

IV. THE EXPERIMENTAL TECHNIQUE

SHAREPOINT CONTENT DATABASE PERFORMANCE

Enhance TempDB

TempDB is the number one blockage for your SharePoint environment. All transactions in all databases go through TempDB first. As a result, it's very important for you to amount TempDB stall periods, dormancies, and disk IO. Safeguard that:

- TempDB is divided into multiple files. The amount of files must be equal to the amount of processors on SQL Server. This has lessening and even negative yields if the number of processors is too high.
- TempDB's retrieval model is set to simple.
- TempDB is on the wildest disks. Stall times should be nearby 1ms on current day hardware.
- The disks have more than 25% of allowed space to accommodate for peak usage.
- Each TempDB file is 25% of the major content database.
- All TempDB files are of equivalent size.
- All Files are divided across multiple disks for better performance.
- TempDB has sufficient free space.

Size Gratified Databases

SharePoint stores the popular of its content in SQL Server databases. Many of these databases are worried with the overall configuration of the system or achieved services support. The mainstream of these databases are those that accept uploaded content or co-operative content. These databases need to be sized with numerous factors in attention, such as:

- The capability to backup/restore the content rapidly, permitting for faster SLAs and separation in the event of database failure.
- The SharePoint system evades SQL Server transactions in many occurrences. It does so to evade locks, but at the cost of subsequent orphaned data or possible data fraud. Superior databases have more orphaned items than lesser ones. Also smaller databases keep the harms isolated.

It's very significant for any project to approximation content database size. This is particularly significant in collaborative document-centric

Schemes. Not doing this upfront preparation can lead to important manageability, performance, and dependability issues. As a rough rule of thumb, use this formula to size a content database:

$$DS = ((DOC \times VER) \times SD) + (10 KB \times (LI + (VER \times DOC)))$$

Where:

DS=Database Size

DOC = Expected number of documents,

VER = Expected number of versions

SD = Average size of the document

LI = Number of list items, and 10KB is the expected metadata on apiece document

Defragment Indexes

Index fragmentation can reason high CPU practice, which means disk usage, and therefore performance deprivation. Any indexes above 50% in fragmentation fractions that disturb more than 4000 rows are bad, and the system performance can expressively benefit from defragmenting the indexes. Note that indexes do

not defragment themselves; this is something a DBA desires to do.

Memory Distribution

SQL Server, by default, is arranged to chomp as much memory as possible. Otherwise, in circumstances where the server is used for other purposes as well the database, when other applications need more memory, SQL Server may have previously consumed all possible memory. This is factual only if you are including the Web front end (WFE) and SQL Server on the same server.

ATTENTIVE QUERY METHODS

Making and applying large lists still requires cautious planning. There are three main approaches that can be used for retrieving list data: Gratified Query Web Part, The list views with metadata navigation, and Exploration and Search. Each technique has pros, cons, and specific uses to which they are well suited.

• The List View & Metadata Navigation

List views continuously contact the Microsoft SQL Server database. This results in sluggish query performance and superior load on SQL Server properties than other approaches. List views also render the greatest HTML, which results in slower page load times than other approaches.

• Gratified Query Web Part

The Content Query Web Part shows a statically arranged sight of data that is cached by Using the Portal Site Map Provider for improved performance. The Gratified Query Web Part reduces the smallest HTML and is cached. The outcome is quicker page load times and it makes it cooler to have many queries on one page. The Gratified Query Web Part should be used to display links to connected documents, list items, or pages.

• Exploration and Search

Search Web Parts can be used to rid queries to a system that is enhanced for judgment content (versus erasure properties and seeing the updates in actual time). Exploration Web Parts can be arranged to use fixed or user-specified queries. Search Web Parts have decent recital.

FILE AND FOLDER LEVEL ANTIVIRUS SOFTWARE IN SHAREPOINT

To arrange your antivirus software to exclude the following folders and subfolders from antivirus scanning:

- *Drive:*\Program Files\Common Files\Microsoft Shared\Web Server Extensions

If you do not want to exclude the whole Web Server Extensions folder from antivirus scanning, then exclude only the following two folders:

- *Drive:*\Program Files\Common Files\Microsoft Shared\Web Server Extensions\15\Logs
- *Drive:*\Program Files\Common Files\Microsoft Shared\Web Server Extensions\15\Data\ Application

The folders may have to be excluded from antivirus scanning while using file-level antivirus software in SharePoint. If these folders are not excluded, may receive "access denied" error messages when files are uploaded.

WINDOWS SERVER HARDWARE SIZING

First, you will want to make sure that the platform that supports SharePoint is sound. To do so, you need to correctly size your

hardware to support the SharePoint tier that is being hosted. You'll also need to ensure that Windows Server has been optimized.

Table 1 lists Microsoft's minimum hardware requirements for web servers and application servers in a farm installation. Keep in mind that these are minimum recommendations and will serve up a minimal experience. If you want to optimize performance, these numbers are not going to be anywhere close to good enough.

	Developer or Evaluation Environments	Single Server or Farm Production Environments
CPU	4 Cores, 64-bit Required	4 Cores, 64-bit Required
RAM	4GB	8GB
Hard Disk Space	80GB	80GB

SQL SERVER HARDWARE SIZING

The SQL Server tier is the one in which you will want to make your hardware investment. CPU and RAM are both crucial to SQL Server performance, but be aware that SQL Server will chew up as much RAM as it can get its teeth into, regardless of load. In most cases, SQL Server takes RAM and never gives it back. CPU will trend up and down over time, but if you don't have enough cores across which to spread the load, you'll find yourself with pegged CPUs and a poorly performing SharePoint farm. Table 2 lists Microsoft's minimum hardware requirements for SQL Servers in a farm installation.

	Small Farm	Medium Farm	Large Farm	
CPU	4 Cores, 64-bit Required	8 Cores, 64-bit Required	As much as 2TB Content database	From 2TB to 5TB Content database
RAM	8GB	16GB	32GB	64GB
Hard Disk Space	80GB	80GB		

MINIMAL DOWNLOAD STRATEGY OVERVIEW

Minimal Download Strategy (MDS) is a new technology in SharePoint 2013 that reduces the amount of data that the browser has to download when users navigate from one page to another in a SharePoint site. When users browse an MDS-enabled site, the client processes only the differences (or delta) between the current page and the requested page. The sections that change from page to page and therefore require an update.

Enable MDS

Enable MDS in your site by using either the site administration pages or the SharePoint client object models. To enable MDS by activating the feature in the administration pages, choose Site settings > Manage site features, and activate the Minimal Download Strategy feature.

Using Minimal Download Strategy provides several benefits, Speed, Smooth Transitions, Browser navigation controls and backward compatibility. The feature is activated by modifying the EnableMinimalDownload property, you can also use the client APIs. The following code shows how to enable MDS using the JavaScript object model (JSOM).

When you open a site or page, you would have noticed "Working on it". This may be annoying sometimes as well as friendly message too. But if you want to speed things up instead of showing this message all the time, you can disable this MDS feature.

The MDS will help pages to perform faster and more smoothly by downloading only content that has changed as you move from page to page.

Disable MDS

The MDS can be disabled from Site Settings -> Manage Site Features -> Minimal Download Strategy -> Deactivate this feature

```

JavaScript

var clientContext;

clientContext = new SP.ClientContext.get_current();
this.oWebsite = clientContext.get_web();

this.oWebsite.set_enableMinimalDownload(true);
this.oWebsite.update();

clientContext.load(this.oWebsite);

clientContext.executeQueryAsync(
    Function.createDelegate(this, successHandler),
    Function.createDelegate(this, errorHandler)
);

function successHandler() {
    alert("MDS is enabled in this site.");
}

function errorHandler() {
    alert("Request failed: " + arguments[1].get_message());
}
    
```

Fig. 2 JavaScript Code

MDS can be activated in a site by either of the following ways

- Activate the web scoped feature – Minimal Download Strategy feature
- Using Server Side Object Model
- Client Side Object Model
- PowerShell

In this paper you will see how to enable Minimal Download Strategy for a site using PowerShell Script. Open SharePoint 2013 Management Shell as an administrator and run the following script.

```

$web=Get-SPWeb "http://SPWeb"
$web.EnableMinimalDownload=$true;
$web.Update();
    
```

V. THE POWERSHELL SCRIPT TECHNIQUE

A very common slow issue is when SharePoint first wakes up. Since SharePoint is a .Net application running on IIS, the application pools need to spin up, compile all of the assemblies and serve up pages. This can take a few minutes when SharePoint initially starts up. In most cases, once you're past this slow start up, SharePoint will continue to run smoothly throughout the day.

In SharePoint 2013, a SharePoint-branded PowerShell is available with all cmdlets preinstalled called **SharePoint 2013 Management Shell**. In Windows 2012, you can type SharePoint 2013 Management Shell to start the shell from Start Menu. This management shell is aware about SharePoint commands as well as general PowerShell Commands.

- Check the Task Manager on servers. Simple enough, but it tells us a lot. Looking at the stats in Task Manager can determine which services are taking up loads of RAM or are pinning the processor. If you're

seeing a lot of w3wp.exe processes, for improvements take a look at **Figure. 4 SharePointWakeUp.PS1** shows PowerShell script

- This PowerShell Script will help to improve SharePoint performance so, that user getting well experience to access SharePoint site without waiting for long time.

Administrators can interact directly with SharePoint 2013 to manipulate web applications, site collections, sites, lists and much more. In addition, an administrator can script cmdlets (pronounced "command-lets"). To run scripts, the minimum required execution policy for SharePoint 2013 is RemoteSigned, although the default policy for Windows PowerShell is Restricted. If the policy is left as Restricted, the SharePoint 2013 Management Shell will change the policy for Windows PowerShell to RemoteSigned. This means that must select **Run as administrator** to start the SharePoint 2013 Management Shell with elevated administrative permission. Windows PowerShell to perform a single administrative task, also use a script to automate a series of tasks. A script is a text file that contains one or more Windows PowerShell commands. Windows PowerShell scripts have a .ps1 file name extension. The PowerShell Scripting Techniques is used to assign various features in SharePoint 2013. Using Scripting techniques to apply Export and Import functionality to get more benefits and ensure task management. Rather than Scripting technique may access

customization technique but to be more efficient to apply PowerShell Scripting Technique. Windows ISE PowerShell launches pseudo development environment in which can create, test, debug, and execute PowerShell Script. It is glorified text editor but is helpful in creating and running scripts.

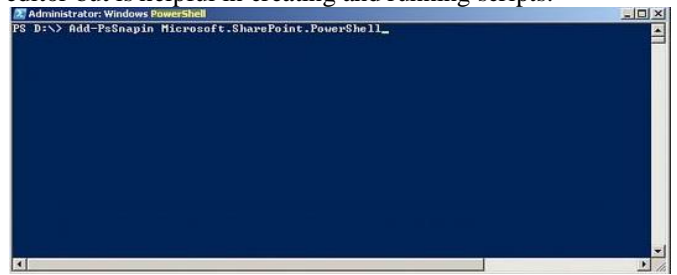


Fig. 3 Adding SharePoint PowerShell SharePointWakeUp.PS1

One trick to avoid this slow start up is to keep SharePoint awake. There is a simple PowerShell script which can schedule in

Windows Tasks to run, and it'll keep hitting your SharePoint sites, thereby keeping them awake.


```
function get-webpage([string]$url,[System.Net.NetworkCredential]$cred=$null)
{ $error = $false
  $webRequest = [System.Net.HttpWebRequest]::Create($url)
  $webRequest.Timeout = 300000
  if($cred -eq $null)
  {
    $webRequest.Credentials = [system.Net.CredentialCache]::DefaultCredentials
  }
  try {
    $res = $webRequest.GetResponse()
  } catch {
    $error = $true
  }
}
Function Load-SharePoint-Powershell
{
  If ((Get-PsSnapin |?{$_.Name -eq "Microsoft.SharePoint.PowerShell"})-eq $null)
  { Write-Host -ForegroundColor White " - Loading SharePoint Powershell Snapin"
    Add-PsSnapin Microsoft.SharePoint.PowerShell -ErrorAction Stop
  }
}
Load-SharePoint-Powershell
$webapplications = Get-SPWebApplication
$AllSites = Get-SPSite -limit all
$array = @()
$i=0
foreach ($wa in $webapplications)
{
  foreach ($windowsauth in $wa.AlternateUrls)
  {
    $authenticationprovider= Get-SPAuthenticationProvider -webapplication $wa -zone $windowsauth.Zone
    If ($authenticationprovider.UseWindowsIntegratedAuthentication)
    {
      $accessibleURL = $windowsauth.IncomingUrl
    }
  }
  if (!$accessibleURL) {$accessibleURL = $wa.url -replace ".$"}
  foreach ($site in $AllSites)
  { if ($site.Url -and $site.Url+ "/" -match $wa.url)
    {
      $subsites = Get-SPSite $site.Url | Get-SPWeb -Limit All
      Foreach ($subsite in $subsites)
      { $i++
        Write-Progress -activity "Looking up all sites" -status "Please Wait..." -PercentComplete ((($i / 500) * 100)
        $PlainWaUrl = $wa.Url -replace ".$"
        $WakeUpSite = $subsite.Url.replace($PlainWaUrl, $accessibleURL)
        $array = $array + $WakeUpSite
        #html=get-webpage -url "$WakeUpSite" -cred $cred;
        if ($i -eq 500){$i=0}
      }
    }
  }
  Remove-Variable accessibleURL
}
$i=0
Foreach ($Website in $array)
{ $i++
  Write-Progress -activity "Waking up sites" -status "Waking: $Website" -PercentComplete ((($i / $array.Count) * 100)
  $html=get-webpage -url "$Website" -cred $cred;
}
```

Fig. 4 SharePointWakeUp.PS1

Proc ID	Name	RAM	CPU
5936	PowerPivot Service	359MB	0%
13332	Web Application: SecurityTokenServiceApplicationPool	179MB	0%
11776	Web Application: SharePoint	340MB	0%
6632	Search Query	261MB	0%
5436	Metadata Service	232MB	0%
5324	PerformancePoint Service	264MB	0%
11132	Web Application: Axceler	531MB	0%
4256	User Profile Service	241MB	0%
9696	Web Application: SharePoint	446MB	0%
4688	Web Analytics	222MB	0%

Fig. 5 Get-SharePointW3WP

Use PowerShell to obtain information from SharePoint about lists, libraries, files, and pages. Windows PowerShell is a command-line shell and scripting language that provides an administrator full access to applicable application programming interfaces (APIs). Administrators can interact directly with SharePoint 2013 to manipulate web applications, site collections, sites, lists and much more. An administrator can script cmdlets (command-lets)

Get-SharePointW3WP

Run this script to see what application pool, w3wp.exe process, is associated with what SharePoint web application or web service application. Also shows current RAM and CPU usage. This script is helpful to understand the services Proc ID, Name, RAM, and CPU usage. It will show the Web Applications and Metadata Services.

VI. CONCLUSION

The experimental techniques eliminates some of the limitations of SharePoint List, SharePoint based Antivirus Software and offers better SharePoint Performance Enhancements. The SharePoint based Content Database Performance will set the content database size so, that to represent the size of data are going to upload. Understanding Microsoft SQL Server and Microsoft IIS improves the SharePoint Performance. The PowerShell Script technique used to hitting the SharePoint that is to keep awake. The PowerShell script technique is used to reduce SharePoint performance. The presented technique has also a better scope of modification. The technique can be modified by introducing the concept of PowerShell Scripting. And it can also be used for Import and Export functionality.

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REFERENCES

[1]Designing large list and maximizing list performance *Topic Last Modified: 2011-09-24*,<https://technet.microsoft.com/en-in/library/cc262813%28v=office.14%29.aspx>
 [2] David Lozzi's Blog-"My Users Don't Like SharePoint because it is too slow!" <http://davidlozzi.com/2013/01/16/my-users-dont-like-sharepoint-because-it-is-too-slow/>
 [3] Use Windows PowerShell to administer SharePoint 2013 *Applies to: SharePoint Server 2013 Standard, SharePoint Server 2013 Enterprise, and SharePoint Foundation 2013 Topic Last Modified:2014-05-16*
 [4]Jason Himmelstein-start with solid foundation SharePoint Pro SharePoint Performance Troubleshooting <http://sharepointpromag.com/sharepoint-2010/sharepoint-performance-troubleshooting> Jan 31, 2012
 [5]Minimal Download Strategy Overview-SharePoint 2013 Last modified: September 23, 2013 *Applies to: SharePoint Foundation 2013 / SharePoint Online*
 [6] PowerShell in SharePoint 2013-Category DNC Magazine Posted by: Pravinkumar Dabade , on 3/1/2014
 [7] SharePoint 2013- "Working on it..." Posted by SM in SharePoint Date-04 Monday, Mar 2013