

## Powershell based, HTML coded tables

Friday, March 04, 2016  
7:57 PM

There are times when you need to take data gotten from some cmdlet as an array and then put it into neat columns for display purposes.

The problem shows up when you look at data on the screen in comparison to data that you output into the body of an email, for example.

The screen shows:

```
Name
----
weekly.106          Created          Total Cumulative Dependency
weekly.106          9/15/2015      149.6 MB    88.7 GB
weekly.107          9/22/2015      600.8 MB    88.6 GB
weekly.108          9/29/2015      986.0 MB    88.0 GB
weekly.109          10/7/2015      192.0 MB    87.0 GB
weekly.110          10/14/2015     16.4 GB     86.8 GB
weekly.111          10/20/2015     5.1 GB      70.4 GB
```

While the email shows as:

```
Name          Created    Total Cumulative Dependency
-----
weekly.106    9/15/2015 149.6 MB  88.6 GB
weekly.107    9/22/2015 600.8 MB  88.4 GB
weekly.108    9/29/2015 986.0 MB  87.8 GB
weekly.109    10/7/2015 192.0 MB  86.9 GB
weekly.110    10/14/2015 16.4 GB   86.7 GB
```

So the question becomes **how** to take array data and have it show up in good columnar order for visibility purposes. This becomes even more important when there are lots of columns and it gets tough to know what data is in what column!!! Such as the following.

```
sysstat -x 1
CPU   NFS   CIFS  HTTP  Total  Net   kB/s  Disk  kB/s  Tape  kB/s  Cache  Cache  CP  CP  Disk  OTHER  FCP  iSCSI  FCP  kB/s  iSCSI  kB/s
      in   out  read write read write read write age hit time ty util  in out  in out
56%   889   19   0    1077 16311 13160 61226 55276 0     0    18s  99%  42% Z  33%  0    31   0    182  1    0    0
55%  1606  195  0    1880 16313 16779 75896 94112 0     0    18s  98%  87% Zv 44%  5    8    9    0    0    0
44%  2872  117  0    3070 25288 14314 33992 8680  0     0    18s  97%  19% Z  37%  0    19   0    125  0    0    0
```

Would be very bad if the data from the wrong column was used for something!

So the challenge has been, how to format the resulting tabular data for inclusion into something like an email message.

The following is using the data coming from the NetApp API call to get info about the snapshots for a volume. The data and format of that output is the first screen shot at the top of this message!

The 'format-table' command does not seem to work that well with lining up data within the columns when put to a disk file. The command of "Write-Output \$snaps | Format-Table -AutoSize", when put to the screen looks real good!

```
Name          Created    Total Cumulative Dependency
-----
weekly.106    9/15/2015 149.6 MB  88.7 GB
weekly.107    9/22/2015 600.8 MB  88.6 GB
weekly.108    9/29/2015 986.0 MB  88.0 GB
weekly.109    10/7/2015 192.0 MB  87.0 GB
weekly.110    10/14/2015 16.4 GB   86.8 GB
```

When sent to a disk file with the command of " Write-Output \$snaps | Format-Table -AutoSize > c:\temp\pdc.txt " that is then opened up, it looks like:

```
Name          Created    Total Cumulative Dependency
-----
weekly.106    9/15/2015 149.6 MB  88.7 GB
weekly.107    9/22/2015 600.8 MB  88.6 GB
weekly.108    9/29/2015 986.0 MB  88.0 GB
```

The rows are really tight and it can be difficult to line up the columns, if there was a lot of them. And there are no options on the 'format-table' command to define column widths at the command line.

So then we get into other options to format the columns of data and putting the output into HTML output seems to be the preferred means and allows for setting up lots of different options on how to create/show the table. And to do that, the magic part is the 'style sheet' contents that define what is going to happen.

One good resource on style sheets can be found here. <https://css-tricks.com/complete-guide-table-element/>

This is a great site that provides interactive option to make changes and see what it does! [http://www.w3schools.com/css/css\\_table.asp](http://www.w3schools.com/css/css_table.asp)

To help with what style setup results in different results, the following shows different examples of what is possible.

When not including options to center text or size the columns, you get the following which is left edge aligned and very tight within the columns.

```
$a = "<style>"
$a = $a + "BODY{background-color:peachpuff;}"
$a = $a + "TABLE{border-width: 1px; border-style: solid; border-color: black; border-collapse: collapse;}"
```

```

$a = $a + "TH{border-width: 1px; padding: 0px; border-style: solid; border-color: black;}"
$a = $a + "TD{border-width: 1px; padding: 0px; border-style: solid; border-color: black;}"
$a = $a + "</style>"
$snaps | ConvertTo-Html -head $a -Property name,created,total, cumulative, dependency |Set-Content c:\temp\snaps.htm

```

name	created	total	cumulative
weekly.106	9/15/2015 5:04:46 PM	156889088	95239540736
weekly.107	9/22/2015 4:47:27 PM	629952512	95082651648
weekly.108	9/29/2015 4:51:13 PM	1033920512	94452699136
weekly.109	10/7/2015 3:04:17 AM	201342976	93418778624
weekly.110	10/14/2015 9:32:19 AM	17631404032	93217435648
weekly.111	10/20/2015 5:27:15 PM	5423857664	75586031616
weekly.112	10/27/2015 4:51:15 PM	235491328	70162173952
weekly.113	11/3/2015 4:45:13 PM	5013054560	60076602624

When we add the 'text-align' and 'width' options you can spread data out and have it line up in columns.

```

$a = "<style>"
$a = $a + "BODY{background-color:peachpuff;}"
$a = $a + "TABLE{border-width: 1px;border-style: solid;border-color: black;border-collapse: collapse;}"
$a = $a + "TH{border-width: 1px;padding: 0px;text-align: center; width: 500px; border-style: solid;border-color: black;}"
$a = $a + "TD{border-width: 1px;padding: 0px;text-align: center;width: 500px; border-style: solid;border-color: black;}"
$a = $a + "</style>"
$snaps | ConvertTo-Html -head $a -Property name,created,total, cumulative, dependency |Set-Content c:\temp\snaps.htm

```

Yields:

name	created	total	cumulative
weekly.106	9/15/2015 5:04:46 PM	156889088	95239540736
weekly.107	9/22/2015 4:47:27 PM	629952512	95082651648
weekly.108	9/29/2015 4:51:13 PM	1033920512	94452699136
weekly.109	10/7/2015 3:04:17 AM	201342976	93418778624
weekly.110	10/14/2015 9:32:19 AM	17631404032	93217435648

We can change the 'padding' from 0px to something else to get more whitespace throughout the result.

```

$a = "<style>"
$a = $a + "BODY{background-color:peachpuff;}"
$a = $a + "TABLE{border-width: 1px;border-style: solid;border-color: black;border-collapse: collapse;}"
$a = $a + "TH{border-width: 1px; padding: 30px; text-align: center; border-style: solid; border-color: black;}"
$a = $a + "TD{border-width: 1px; padding: 30px; text-align: center; border-style: solid; border-color: black;}"
$a = $a + "</style>"
$snaps | ConvertTo-Html -head $a -Property name,created,total, cumulative, dependency |Set-Content c:\temp\snaps.htm

```

name	created	total	cumulative
weekly.106	9/15/2015 5:04:46 PM	156889088	95239540736
weekly.107	9/22/2015 4:47:27 PM	629952512	95082651648
weekly.108	9/29/2015 4:51:13 PM	1033920512	94452699136

```

$a = "<style>"
$a = $a + "BODY{background-color:peachpuff;}"
$a = $a + "TABLE{border-width: 1px;border-style: solid;border-color: black;border-collapse: collapse;}"
$a = $a + "TH{border-width: 1px;padding: 6px; align-text: center; vertical-align:center; border-bottom: 2px solid #ddd;border-color: black;}"
$a = $a + "TD{border-width: 1px;padding: 6px; align-text: center; vertical-align:center; border-bottom: 2px solid #ddd;border-color: black;}"
$a = $a + "</style>"
$snaps | ConvertTo-Html -head $a -Property name,created,total, cumulative, dependency |Set-Content c:\temp\snaps.htm

```

name	created	total	cumulative
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weekly.112	10/27/2015 4:51:15 PM	235491328	70162173952

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$> = $> + "TD{border-width: 1px;padding: 6px; align-text: center; vertical-align:center; border-bottom: 2px solid #ddd;border-color: black;}"
$> = $> + "</style>"

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weekly.110	10/14/2015 9:32:19 AM	17631404032	93217435648
weekly.111	10/20/2015 5:27:15 PM	5423857664	75586031616

```

$> = "<style>"
$> = $> + "BODY{background-color:peachpuff;}"
$> = $> + "TABLE{border-width: 1px;border-style: solid;border-color: black;border-collapse: collapse;}"
$> = $> + "TH{border-width: 1px;padding-top:10px; text-align: center; vertical-align:center; border-bottom: 2px solid #ddd;border-color: black;}"
$> = $> + "TD{border-width: 1px;padding-bottom:6px; text-align: center; vertical-align:center; border-bottom: 2px solid #ddd;border-color: black;}"
$> = $> + "</style>"
$>snaps | ConvertTo-Html -head $> -Property name,created,total, cumulative, dependancy |Set-Content c:\temp\snaps.htm

```

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weekly.106	9/15/2015 5:04:46 PM	156889088	95239540736
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weekly.108	9/29/2015 4:51:13 PM	1033920512	94452699136
weekly.109	10/7/2015 3:04:17 AM	201342976	93418778624
weekly.110	10/14/2015 9:32:19 AM	17631404032	93217435648
weekly.111	10/20/2015 5:27:15 PM	5423857664	75586031616
weekly.112	10/27/2015 4:51:15 PM	235491328	70162173952
weekly.113	11/3/2015 4:45:13 PM	5013954560	69926687624

```

$A = "<style>"
$A = $A + "BODY{background-color:peachpuff;}"
$A = $A + "TABLE{border-width: 1px;border-style: solid;border-color: black;border-collapse: collapse;}"
$A = $A + "TH{border-width: 1px; padding-top:10px; padding-bottom:6px; text-align: center; vertical-align:center; border-bottom: 2px solid #ddd; border-color: black;}"
$A = $A + "TD{border-width: 1px; padding: 6px; text-align: center; vertical-align:center; border-bottom: 2px solid #ddd; border-color: black;}"
$A = $A + "</style>"
$Snaps | ConvertTo-Html -head $A -Property name,created,total, cumulative, dependency |Set-Content c:\temp\snaps.htm

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weekly.109	10/7/2015 3:04:17 AM	201342976	93418778624
weekly.110	10/14/2015 9:32:19 AM	17631404032	93217435648
weekly.111	10/20/2015 5:27:15 PM	5423857664	75586031616
weekly.112	10/27/2015 4:51:15 PM	235491328	70162173952
weekly.113	11/3/2015 4:45:13 PM	5013954560	69926682624

To do padding just right/left and **not** top/bottom, do the following

```

$A = "<style>"
$A = $A + "BODY{background-color:peachpuff;}"
$A = $A + "TABLE{border-width: 1px;border-style: solid;border-color: black;border-collapse: collapse;}"
$A = $A + "TH{border-width: 1px;padding-top:10px; padding-bottom:6px; text-align: center; vertical-align:center; border-bottom: 2px solid #ddd;border-color: black;}"
$A = $A + "TD{border-width: 1px;padding-left:10px; padding-right:10px; text-align: center; vertical-align:center; border-bottom: 2px solid #ddd;border-color: black;}"
$A = $A + "</style>"
$Snaps | ConvertTo-Html -head $A -Property name,created,total, cumulative, dependency |Set-Content c:\temp\snaps.htm

```

name	created	total	cumulative
weekly.106	9/15/2015 5:04:46 PM	156889088	95239540736
weekly.107	9/22/2015 4:47:27 PM	629952512	95082651648
weekly.108	9/29/2015 4:51:13 PM	1033920512	94452699136
weekly.109	10/7/2015 3:04:17 AM	201342976	93418778624
weekly.110	10/14/2015 9:32:19 AM	17631404032	93217435648
weekly.111	10/20/2015 5:27:15 PM	5423857664	75586031616
weekly.112	10/27/2015 4:51:15 PM	235491328	70162173952
weekly.113	11/3/2015 4:45:13 PM	5013954560	69926682624

There is another way to do tables and have the output be mailable. The following code will take an array result from an API call and then read each row within the array and format the output to specific column widths. Putting in column headers with this method is very tedious to figure out spacing. It also includes the means to convert large numbers to small numbers, for example, 95239540736 to 88.6 GB.. This method was used in the Cobian Backup scheduled task to create a snapshot on Tuesday evening at 7PM and delete the oldest one.

If you are using the '-f' formatting option, there is more info about some numeric/hex format: <https://technet.microsoft.com/en-us/library/ee692795.aspx>

```

Function Format-BigNumber () {
[cmdletbinding()]
Param ([long]$Type)
If ($Type -ge 1TB) {[string]::Format("{0:0.00} TB", $Type / 1TB)}
Elseif ($Type -ge 1GB) {[string]::Format("{0:0.00} GB", $Type / 1GB)}
Elseif ($Type -ge 1MB) {[string]::Format("{0:0.00} MB", $Type / 1MB)}
Elseif ($Type -ge 1KB) {[string]::Format("{0:0.00} KB", $Type / 1KB)}
Elseif ($Type -gt 0) {[string]::Format("{0:0.00} Bytes", $Type)}
Else {""}
} # End of function

$Snaps = get-nasnapshot -targetname NNAMP011_CIFS_SATA_LaptopBackup_001 -snapname weekly.*
write-output $Snaps
$body = "Here are the currently known WEEKLY snapshots for: " + $volumename + "`r`n`n"
$body = $body + "Name                Created                Total                Cumulative                Dependency`r`n`n"
$body = $body + "_____                _____                _____                _____                _____`r`n`n"

```

```
foreach ($snaplist in $snaps) {
$body = $body + "'r'n(0,-20) {1,35} {2,20} {3,20} {4,10}'" -f `
$Snaplist.name, $Snaplist.created, (Format-BigNumber $Snaplist.total) , (Format-BigNumber $Snaplist.cumulative), $Snaplist.dependency
}
```

Name	Created	Total	Cumulative	Dependency
weekly.106	9/15/2015 5:04:46 PM	149.62 MB	88.70 GB	
weekly.107	9/22/2015 4:47:27 PM	600.77 MB	88.55 GB	
weekly.108	9/29/2015 4:51:13 PM	986.02 MB	87.97 GB	
weekly.109	10/7/2015 3:04:17 AM	192.02 MB	87.00 GB	
weekly.110	10/14/2015 9:32:19 AM	16.42 GB	86.81 GB	
weekly.111	10/20/2015 5:27:15 PM	5.05 GB	70.39 GB	
weekly.112	10/27/2015 4:51:15 PM	224.58 MB	65.34 GB	
weekly.113	11/3/2015 4:45:13 PM	4.67 GB	65.12 GB	
weekly.114	11/10/2015 4:49:55 PM	184.34 MB	60.45 GB	

Another example using data from a call to the invoke-nasysstat API, writing the data to a CSV file and then reading the file back into an array and pulling parts of the data out into a nice chart. The difference here is that there are column lines and no row lines as well as padding to spread the columns out

```
$a = "<style>"
$a = $a + "BODY{background-color:peachpuff;}"
$a = $a + "TABLE{border-width: 1px;border-style: solid;border-color: black;border-collapse: collapse;}"
$a = $a + "TH{border-width: 1px;padding-left:10px; padding-right:10px; text-align: center; vertical-align:center; border-left:2px solid black;border-right:2px solid black;}"
$a = $a + "TD{border-width: 1px;padding-left:10px; padding-right:10px; text-align: center; vertical-align:center; border-left:2px solid black;border-right:2px solid black;}"
$a = $a + "</style>"
```

```
$pdcl | ConvertTo-Html -head $a -Property cpu_busy,nfs_ops,cifs_ops,http_ops,iscsi_ops, net_data_recv, net_data_sent |Set-Content c:\temp\sysstat.htm
```

Yields:

cpu_busy	nfs_ops	cifs_ops	http_ops	iscsi_ops	net_data_recv	net_data_sent
31.08	1549.83	0.33	0.00	0.00	16917.37	6862.77
22.96	1330.10	0.15	0.00	0.00	8016.27	4630.84
22.75	1143.56	2.12	0.00	0.00	8443.31	7923.85
19.70	889.22	4.07	0.00	0.00	5706.43	4225.29
22.47	1237.05	5.51	0.00	0.00	8281.70	2465.59

And if you do want just a box around the data and no other lines, you can do something like:

```
$a = "<style>"
$a = $a + "BODY{background-color:peachpuff;}"
$a = $a + "TABLE{border-width: 1px;border-style: solid;border-color: black;border-collapse: collapse;}"
$a = $a + "TH{border-width: 1px;padding-left:10px; padding-right:10px; text-align: center; vertical-align:center;}"
$a = $a + "TD{border-width: 1px;padding-left:10px; padding-right:10px; text-align: center; vertical-align:center;}"
$a = $a + "</style>"
```

```
$pdcl | ConvertTo-Html -head $a -Property cpu_busy,nfs_ops,cifs_ops,http_ops,iscsi_ops, net_data_recv, net_data_sent |Set-Content c:\temp\sysstat.htm
```

Yields:

cpu_busy	nfs_ops	cifs_ops	http_ops	iscsi_ops	net_data_recv	net_data_sent
31.08	1549.83	0.33	0.00	0.00	16917.37	6862.77
22.96	1330.10	0.15	0.00	0.00	8016.27	4630.84
22.75	1143.56	2.12	0.00	0.00	8443.31	7923.85
19.70	889.22	4.07	0.00	0.00	5706.43	4225.29
22.47	1237.05	5.51	0.00	0.00	8281.70	2465.59