An Introduction to z/VM Planner for Linux Guests V1.0b

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Agenda

- What is z/VM Planner for Linux Guests?
 - Brief survey of other sizing tools
- Inputs
- Usage considerations
- Sample exercise
- Where to get more information



What is z/VM Planner for Linux Guests?

- Sizing tool from ATS Washington Systems Center
- Java based PC application for Windows XP or Vista
- Replaces a previous z/VM Sizing tool (controlled offering)
- Relies on knowing capacity requirement for each z/VM guest
 - Tool does not include an inventory of distributed servers
 - Uses Linux workload capacity characterizations from zPSG or via Techline for workloads not supported by zPSG



Brief survey of other sizing tools

System z (ATS) Sizing and TCO Tools

- SCON Server Consolidation for Linux on z
- SURF Server Utilization Reduction facility
 - Processes utilization logs from distributed servers
- zRACE Total Cost of Ownership

Software specific sizings

Refer to the <u>Techline Americas Software Sizing</u> page

Note: Business Partners need to engage Techline to perform studies using these tools.



Inputs

- Quantify the number of z/VM guests (generally each = 1 Linux application)
- For each intended z/VM guest, specify:
 - Linux workload description (choose from list)
 - Capacity requirement (favored metric = MIPS)
 - Virtual CPs and z/VM Share
- Specify a target System z processor (General Purpose CPs or IFLs)
- Assess the pattern of workload peaks
 - Do the servers peak at random times?
 - Complementary peaks
 - Do the servers all peak at the same time?
 - Concurrent peaks (If that occurs, ask 'For how long?')



Usage Considerations

- z/VM Planner is generally used for new Linux workloads, that are not currently running on IBM System z processors.
 - For existing workloads, use zCP3000 or VM Monitor data to size capacity and project future growth or expansion.
- z/VM planner suggests that capacity be defined in terms of MIPS.
 - zPSG can be used to estimate MIPS requirements
 - Techline can estimate a workload size, based on the consumption of distributed servers. See this document for details:

IBM Employees: <u>Techdocs | Sizing: Linux Server Consolidation (SCON)</u>

IBM Business Partners: <u>Techdocs | Sizing: zSeries Linux Server Consolidation (SCON)</u>

- zPCR is used to identify IBM System z processor with the necessary capacity
- Always use the latest version of the z/VM Planner, downloaded from:

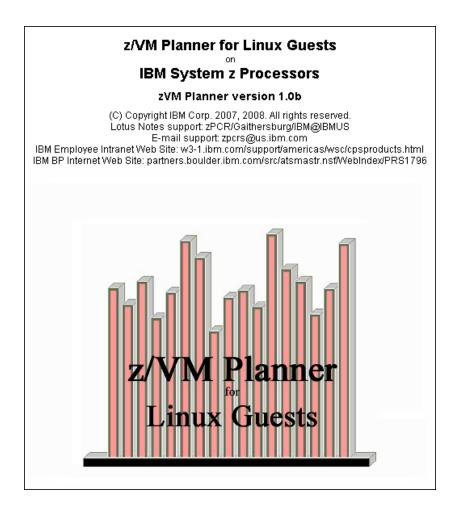
IBM Employees: System z | ATS CPS Tools
IBM Business Partners: Techdocs | ATS CPS Tools

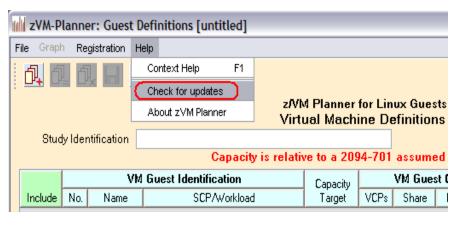


Sample Exercise – Assumptions Used

- Add a new Linux workload of 250 MIPS per server
- Use 2 scenarios for target processor.
 - 1-way IFL
 - 7-way IFL
- Demonstrate effect of complementary versus concurrent peaks
- Demonstrate user input, for alternate scenarios

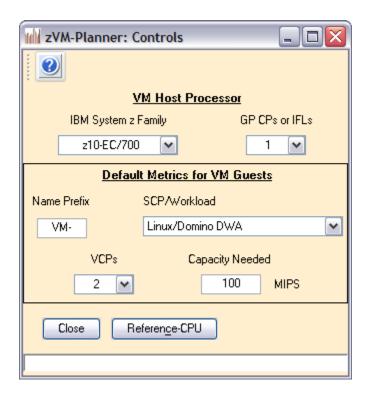






Logo screen – Note which version and check for the most recent one on the CPS Tools page by using Help ==> Check for Updates





This is the initial window, Contols, with default values. VCPs (Virtual CPs) set to 2 by default, per a suggestion from Richard Lewis.



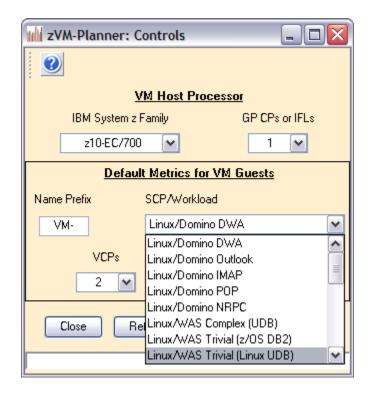


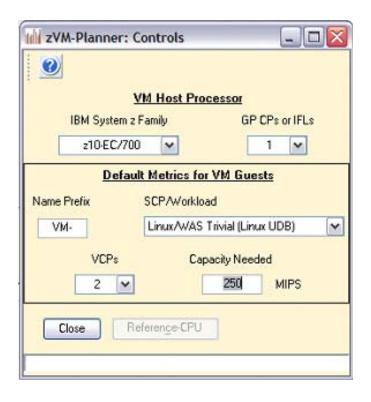
Illustration of the drop down box for workload definition.

The Data Collection Guide, available in Techdocs, has the same list of workloads.

IBM Employees: <u>Techdocs | Sizing: z/VM Planner for Linux Guests Sizing</u>

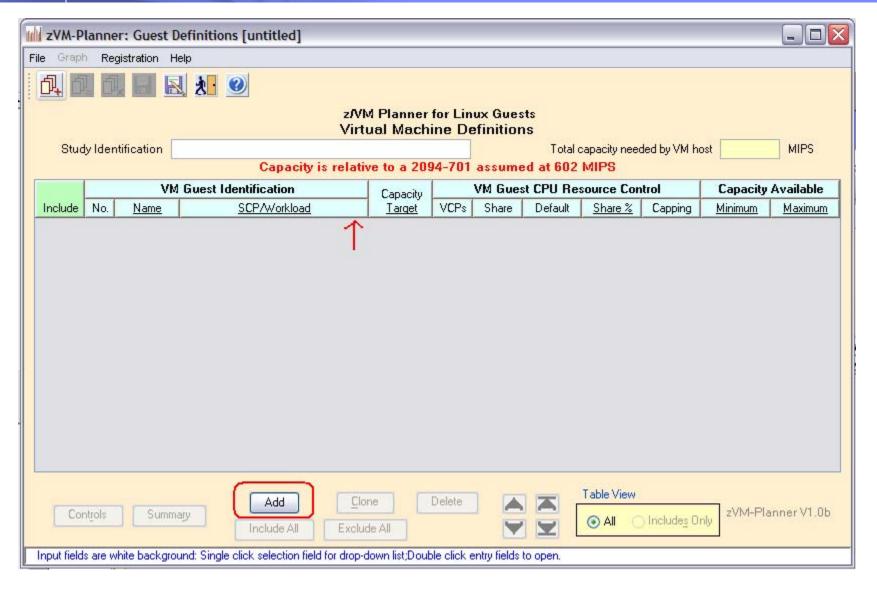
Business Partners: Techdocs | Sizing: z/VM Planner for Linux Guests Sizing





Completed Controls window.





The Guest Definition window. Use the "Add" button to begin describing servers. The red arrow marks where a drop down box will appear.

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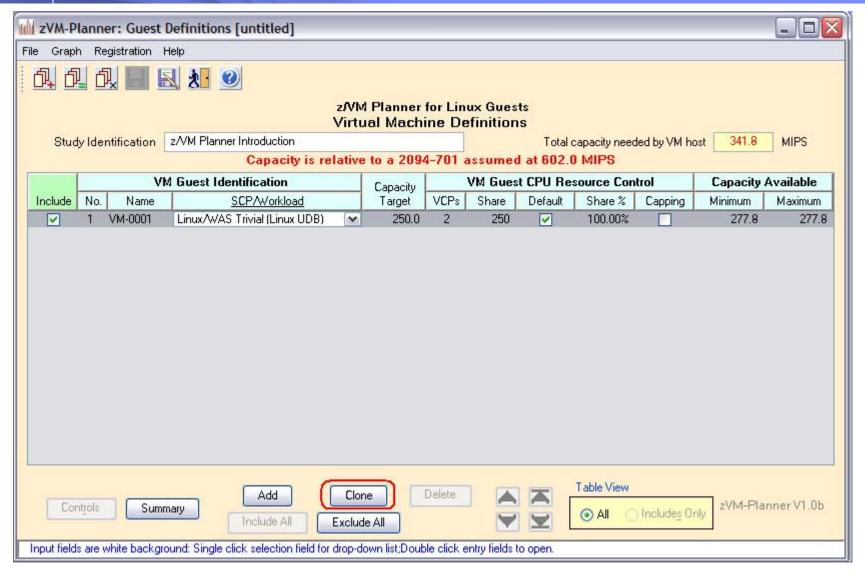
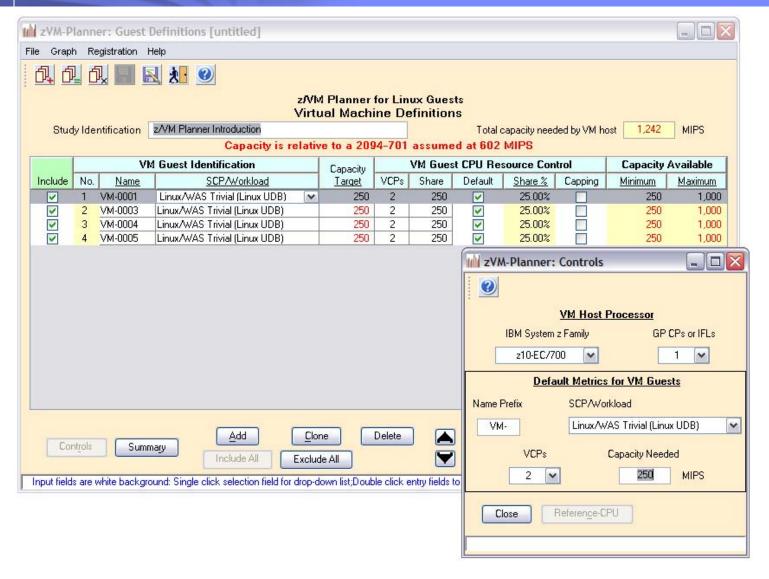


Illustration of the drop down box where the red arrow was. Once you have a server defined, use the Clone button to create multiple entries.

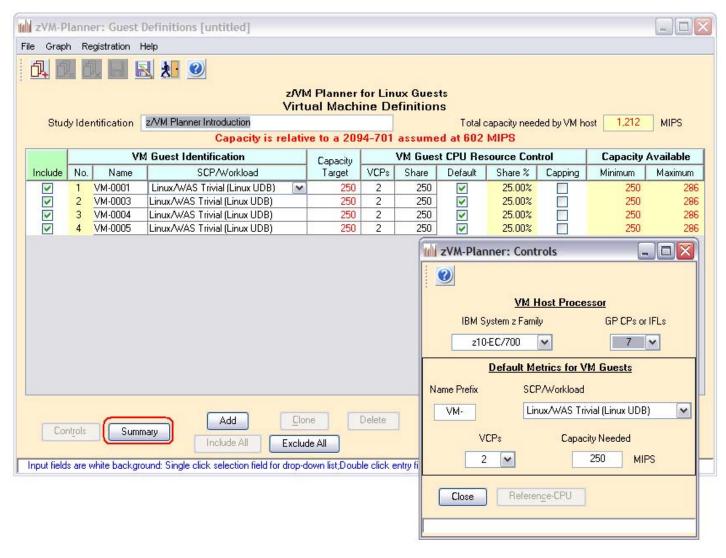
Look for white background fields to input values throughout the tool.





Completed Guest Definition window. The tool has added up the MIPS needed by each server, and added an amount for z/VM. Notice that ONE real CP is being asked to look like EIGHT virtual CPs. Not efficient, and not recommended. Compare 1,242 MIPS to the next slide.





Now, SEVEN real CPs are asked to look like EIGHT virtual CPs. The MIPS requirement has gone down from 1,242 to 1,212 since there is not as much z/VM overhead.

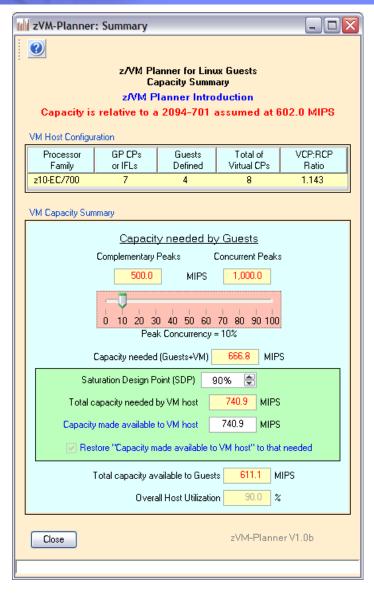
Press the Summary button to go to the next step.



| zVM-Planner: Summary | | | | |
|---|-----|-------------------|-------------------------|------------------|
| | | | | |
| z/VM Planner for Linux Guests Capacity Summary | | | | |
| z/VM Planner Introduction | | | | |
| Capacity is relative to a 2094-701 assumed at 602 MIPS | | | | |
| VM Host Configuration | | | | |
| Process Family | | Guests Defined | Total of Virtual CPs | VCP:RCP Ratio |
| z10-EC/70 | 0 7 | 4 | 8 | 1.143 |
| VM Capacity Summary | | | | |
| Capacity needed by Guests | | | | |
| Complementary Peaks Concurrent Peaks | | | | |
| 500 MIPS 1,000 | | | | |
| | | | | |
| 0 10 20 30 40 50 60 70 80 90 100 | | | | |
| Peak Concurrency = 100% | | | | |
| Capacity needed (Guests+VM) 1,212 MIPS | | | | |
| Saturation Design Point (SDP) 90% | | | | |
| Total capacity needed by VM host 1,347 MIPS | | | | |
| Capacity made available to VM host 1,347 MIPS | | | | |
| Restore "Capacity made available to VM host" to that needed | | | | |
| Total capacity available to Guests 1,111 MIPS | | | | |
| Overall Host Utilization 90.0 % | | | | |
| Close zVM-Planner V1.0b | | | | |
| | | | | |
| | | | | |

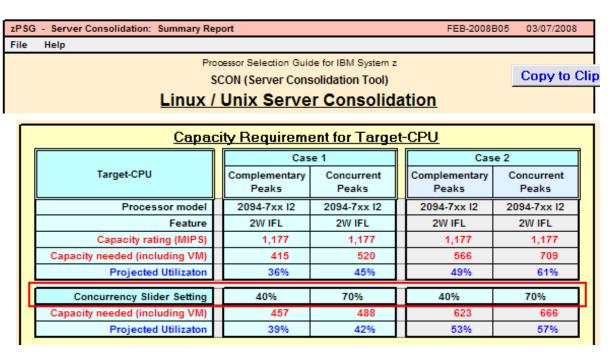
The Summary window. The slider is used to account for non-concurrent peaks. Compare 1,212 MIPS at 100% Concurrent to the next slide.

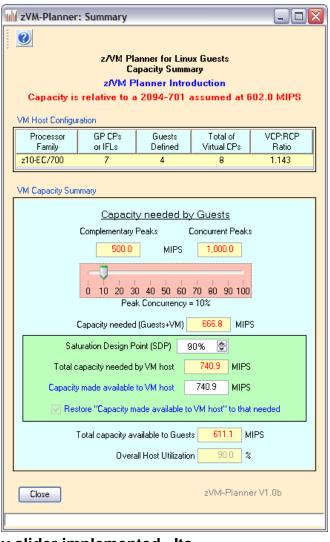




Assuming more Complementary peaks, MIPS needed is now 666.8 MIPS instead of 1,212 MIPS.





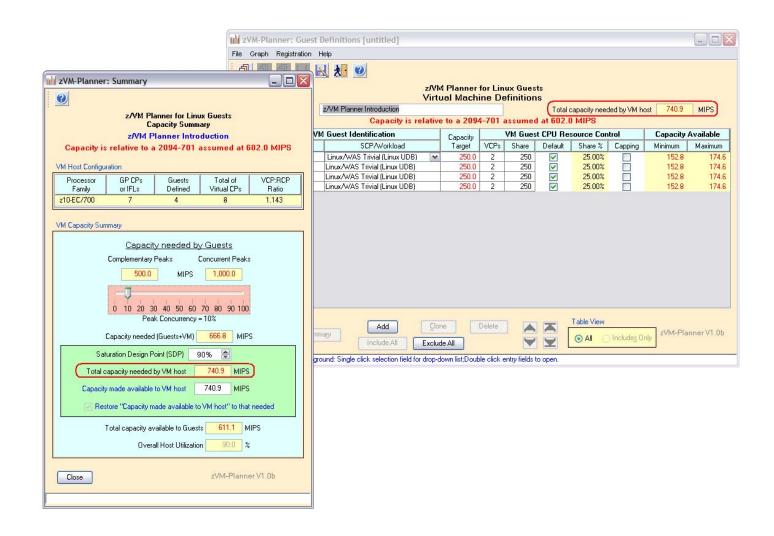


The Server Consolidation tool (SCON) also has a concurrency slider implemented. Its default values range from 40% Complementary to 70% Concurrent.

To get similar answers from both tools, the concurrency settings need to be the same.

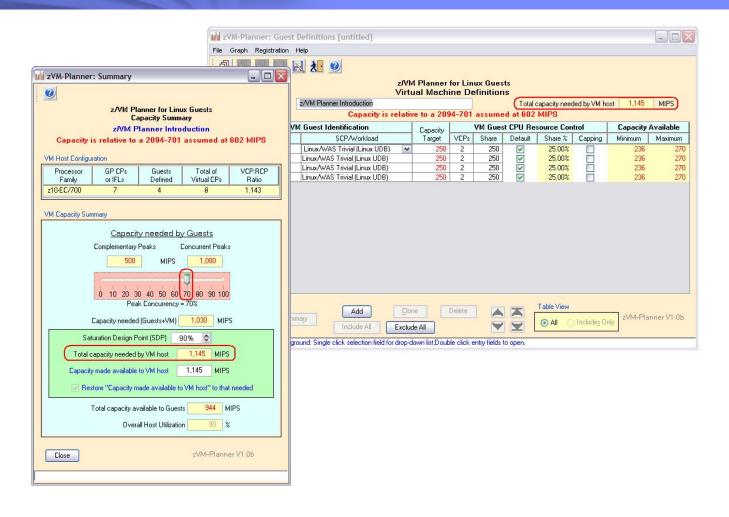
The zRACE term is "smoothing".





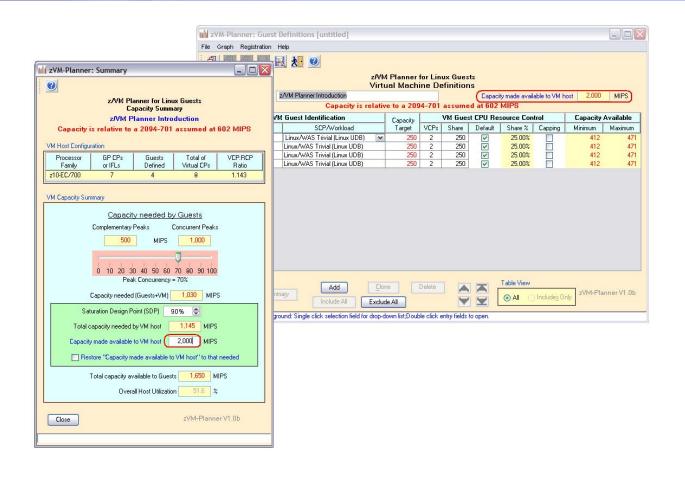
With the slider adjusted, the Guest Definition screen has changed.





With the slider adjusted again, the Guest Definition screen has changed. It is also possible to input your own MIPS value, to see the effect.

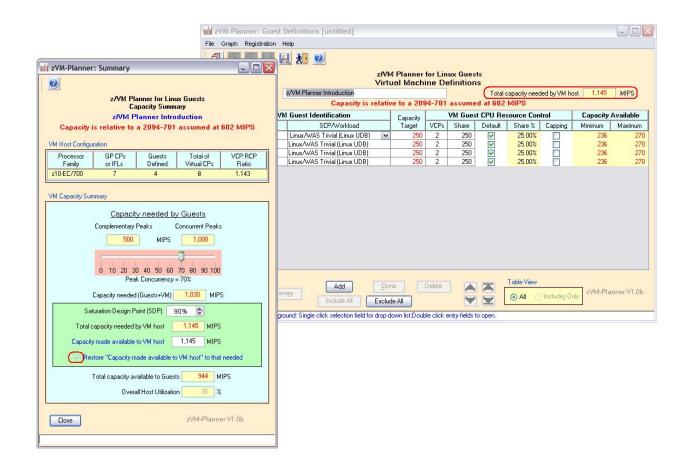




Enter 2,000 in the input field – note the white background.

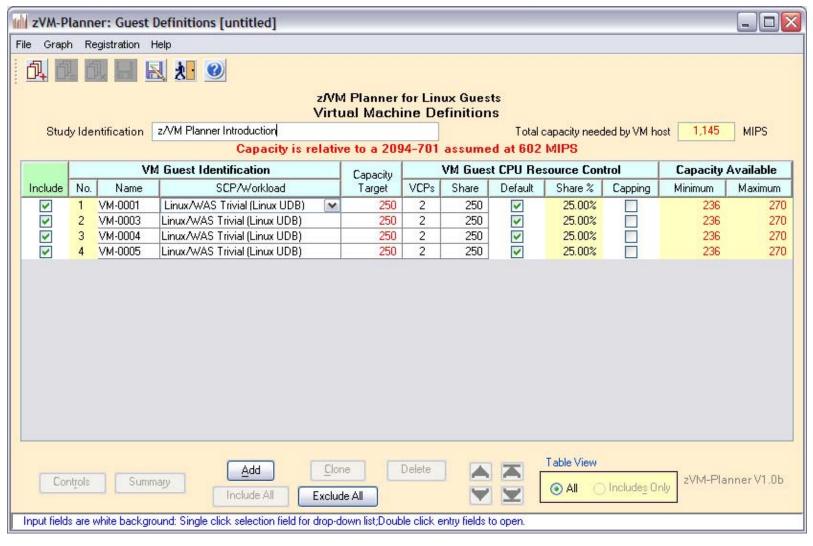
The Guest Definition screen has changed the value, and the description.





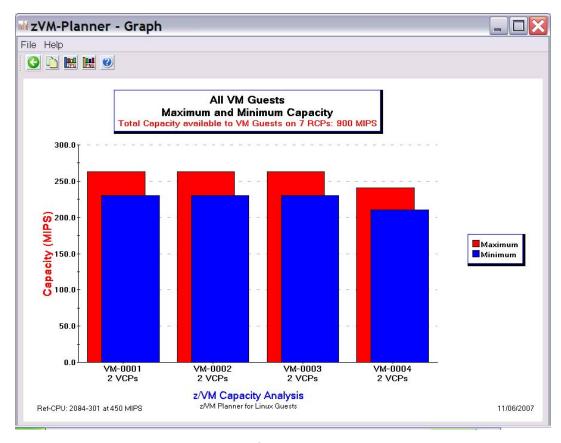
To undo the change, click the checkbox. Guest Definition screen is updated.





The Guest Definition screen shows the total Capacity needed has changed, along with the Minimum and Maximum. Minimum Capacity Available – when ALL guests are competing for CPU (100% Concurrent peaks)

Maximum Capacity Available – when NO other guest is competing for CPU (0% Concurrent = Complementary peaks) *Perfectly* round robin distribution.



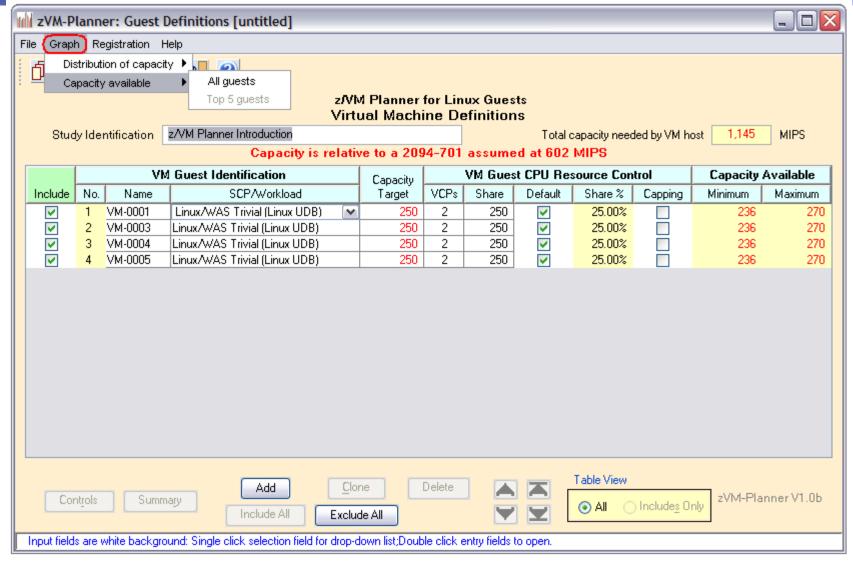
Minimum and Maximum Capacity can be graphed.

The SURF tool can be used to process log files from distributed servers and determine how much actual contention exists.

IBM Employees: <u>Techdocs | Sizing: SURF - The Server Utilization Reduction Facility</u>

IBM Business Partners: <u>Techdocs | Sizing: SURF - The Server Utilization Reduction Facility</u>





Graphs are available on the Guest Definition screen



Where to find more information

This concludes the introduction to z/VM Planner for Linux Guests.

- The z/VM Planner tool is available to the field, or Techline can perform the sizing.
- Contact ATS or Techline if you have any questions.
- Find more information at these web pages:

IBM Employees: System z | ATS CPS Tools

Techdocs | Sizing: z/VM Planner for Linux Guests

IBM Business Partners:

Techdocs | ATS CPS Tools

Techdocs | Sizing: z/VM Planner for Linux Guests