

SnapVantage™ A Linux Cloning Tool

Donald Johnson

Session 9270

August 23, 2002

<http://www.storagetek.com>

Trademarks



The following are trademarks or registered trademarks of Storage Technology Corporation: StorageTek, SnapVantage, Shared Virtual Array, SVA and Iceberg.

The following are trademarks or registered trademarks of the International Business Machines Corporation: IBM, RVA, RAMAC, zSeries, S/390, VM, z/OS and z/VM.

Linux is a registered trademark of Linus Torvalds.

Agenda



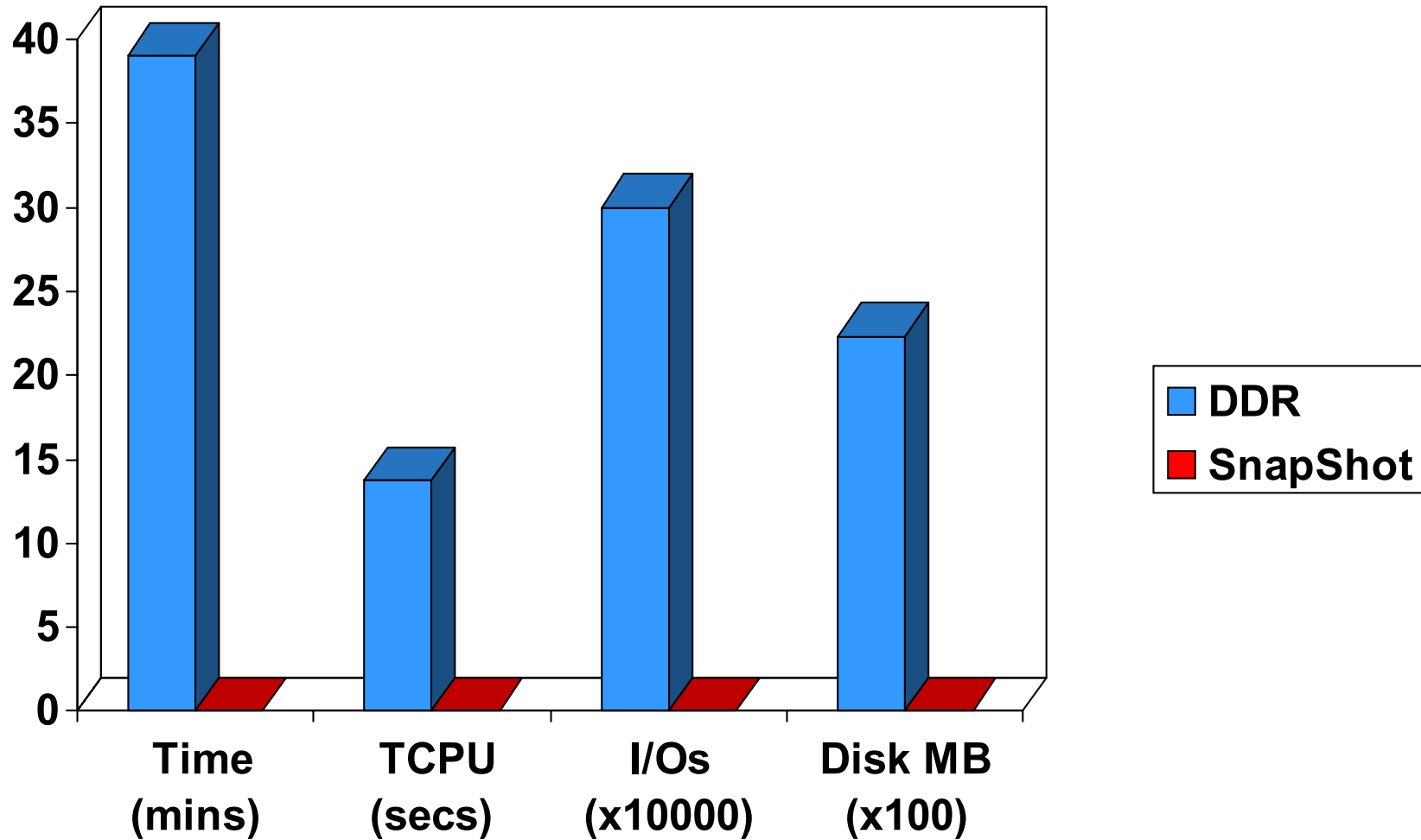
- SnapShot
- Clone Creation
- Implementation
- Q&A

The SnapShot Advantage

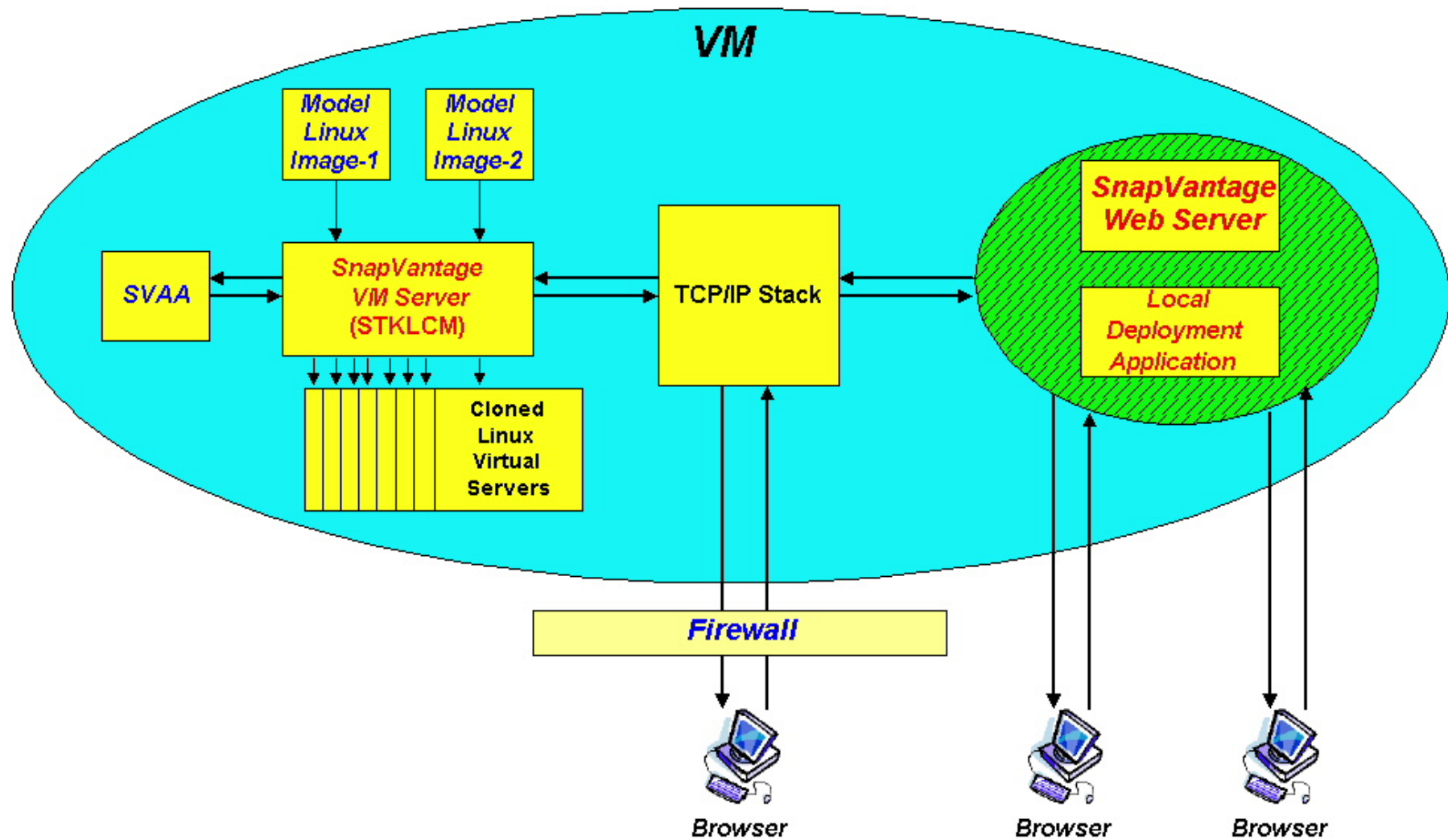


- Iceberg Virtual Disk
 - IBM Ramac Virtual Array (RVA)
 - StorageTek Shared Virtual Array (SVA)
- SVAA SnapShot
 - Fast Disk Copy Utility
 - Functionally equivalent to DDR
 - Takes no additional disk storage

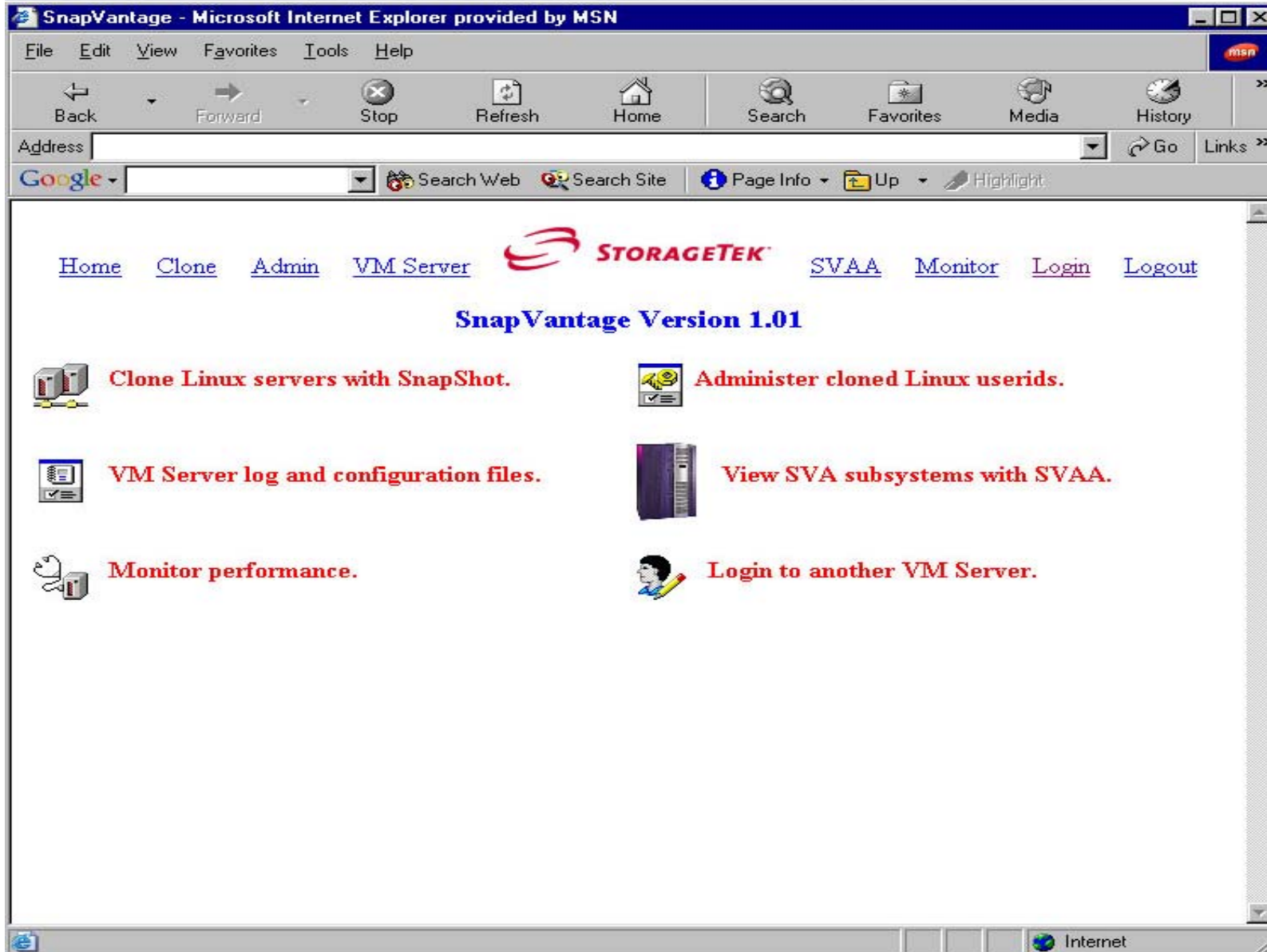
Minidisk Copy - 10,000 Cylinders









SnapVantage Overview



SnapVantage Home Page

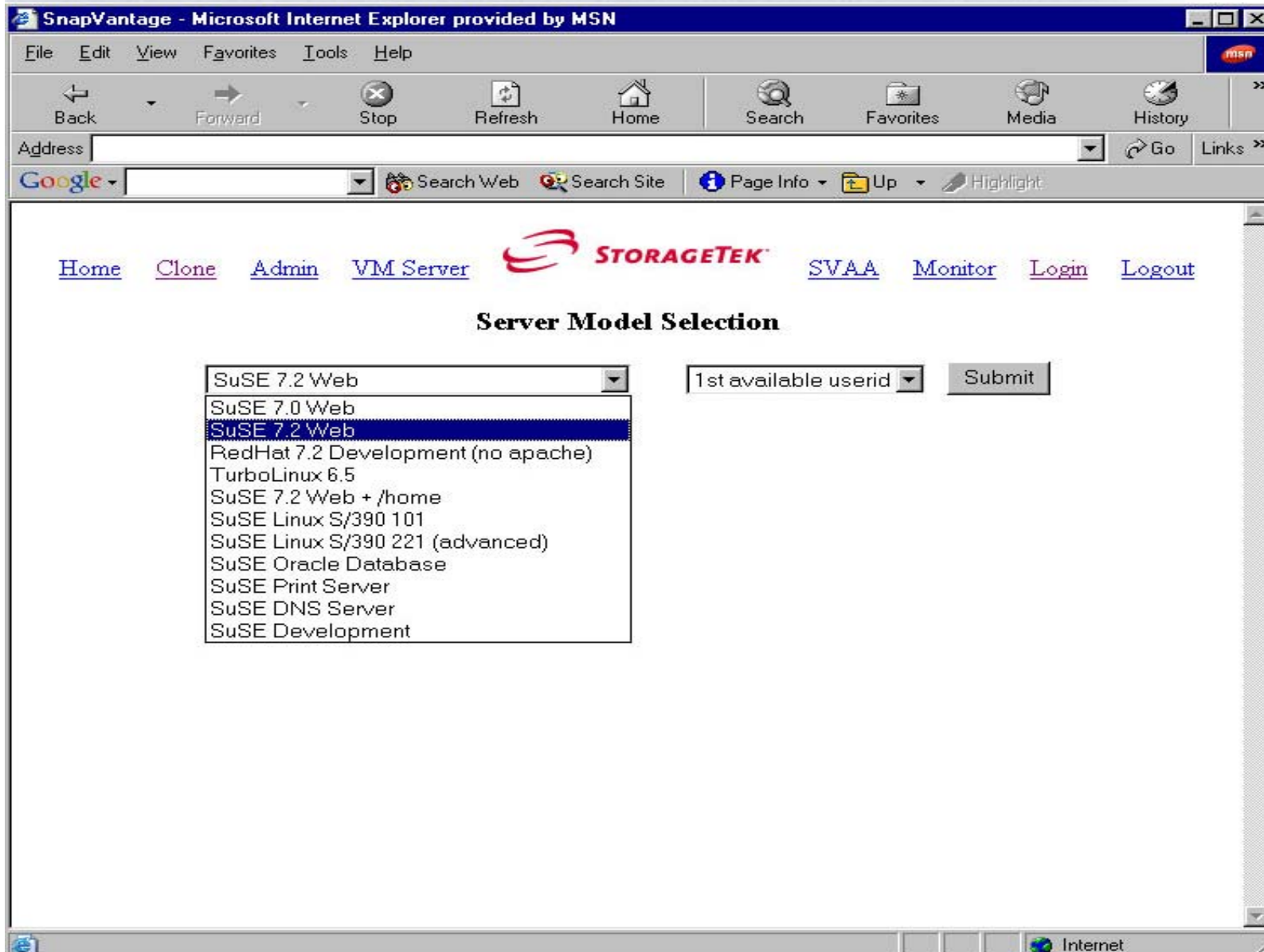


The screenshot shows a Microsoft Internet Explorer browser window displaying the SnapVantage home page. The browser title is "SnapVantage - Microsoft Internet Explorer provided by MSN". The address bar is empty. The page content includes a navigation menu with links for Home, Clone, Admin, VM Server, SVAA, Monitor, Login, and Logout. The main heading is "SnapVantage Version 1.01". Below this, there are six feature highlights, each with an icon and a description:

-  **Clone Linux servers with SnapShot.**
-  **Administer cloned Linux userids.**
-  **VM Server log and configuration files.**
-  **View SVA subsystems with SVAA.**
-  **Monitor performance.**
-  **Login to another VM Server.**

The browser's status bar at the bottom shows "Internet".

Linux Model Selection




SnapVantage - Microsoft Internet Explorer provided by MSN

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites Media History

Address

Google Search Web Search Site Page Info Up Highlight

[Home](#) [Clone](#) [Admin](#) [VM Server](#)  [SVAA](#) [Monitor](#) [Login](#) [Logout](#)

Server Model Selection

SuSE 7.2 Web
SuSE 7.0 Web
SuSE 7.2 Web
RedHat 7.2 Development (no apache)
TurboLinux 6.5
SuSE 7.2 Web + /home
SuSE Linux S/390 101
SuSE Linux S/390 221 (advanced)
SuSE Oracle Database
SuSE Print Server
SuSE DNS Server
SuSE Development

1st available userid Submit

Internet

Clone Options


SnapVantage - Microsoft Internet Explorer provided by MSN

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites Media History

Address

Google Search Web Search Site Page Info Up Highlight

[Home](#)
[Clone](#)
[Admin](#)
[VM Server](#)

[SVAA](#)
[Monitor](#)
[Login](#)
[Logout](#)

Model Parameters for SUSE72

Root Password	Server Name	IP	Peer	DNS
not4you	ctlhx01	129.80.129.156	129.80.123.254	129.80.5.148

New Root Password:
 Autolog Priority:
 Boot Device:
 Memory MB:
 Expiration Date:

#	Request	Model Userid	Vdev	Storage Pool	Linux Server Mdisk	Size	Type	Description	
1	SnapShot	DONJ	1200	DJPOOL	150	200	3390	swap	<input type="button" value="delete"/>
2	SnapShot	DONJ	1201	DJPOOL	151	3000	3390	boot	<input type="button" value="delete"/>
3									<input type="button" value="delete"/>

Internet



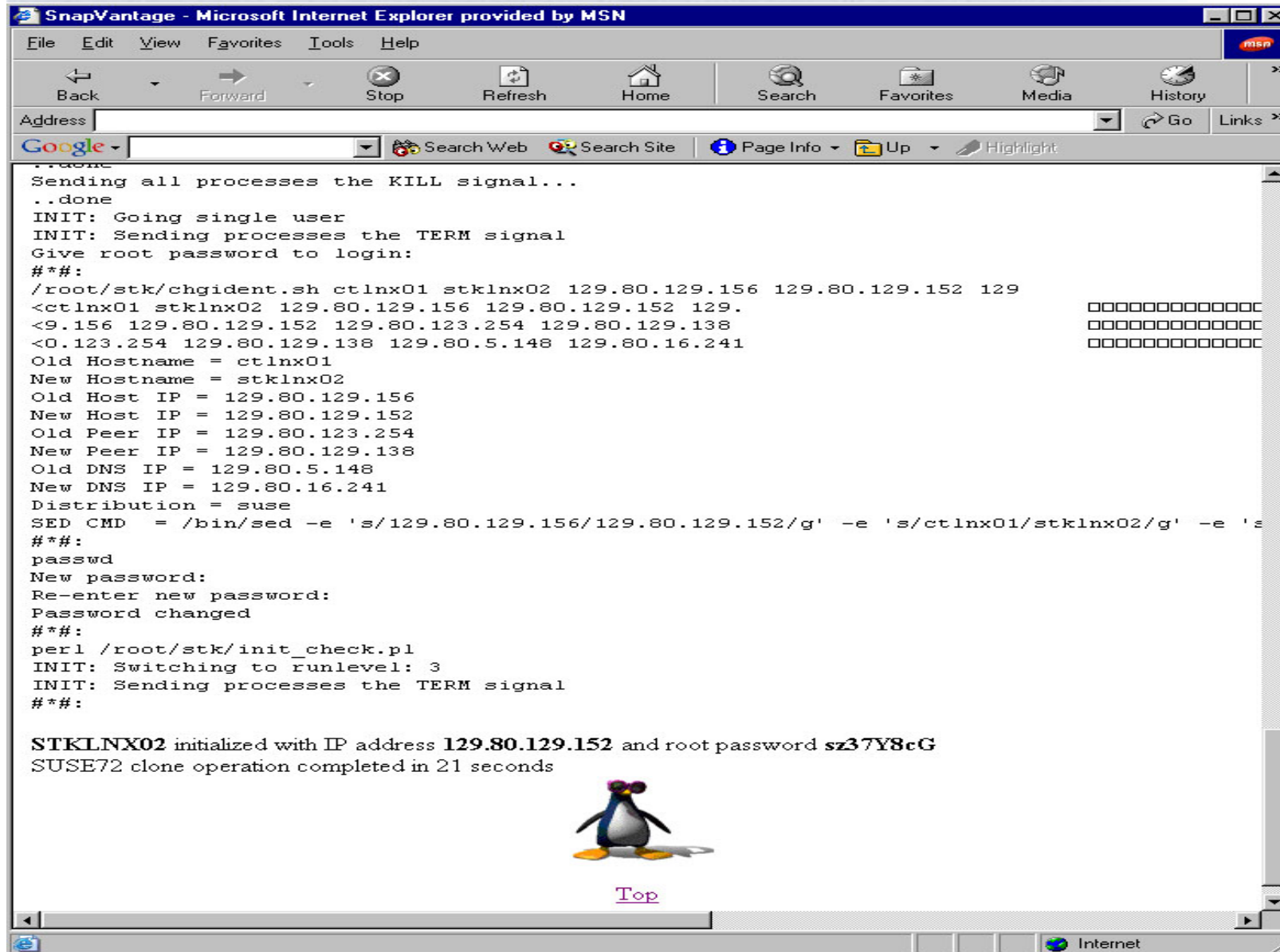
SHARE

Technology - Connections - Results

Linux Boot Messages

```
SnapVantage - Microsoft Internet Explorer provided by MSN
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites Media History
Address
Google Search Web Search Site Page Info Up Highlight
Home Clone Admin VM Server STORAGETEK SVAA Monitor Login Logout
Linux Boot Messages
SIBLCMBL -R(INIT) -V(1.01) -D(OFF) -SC() -PID(SnapVantage)
z/VM V4.2.0 2002-04-02 11:57
DMSACP723I A (191) R/O
DMSACP723I D (192) R/O
DMSACP723I E (194) R/O
Ready:
17:21:29 SIBLCMBL: Linux boot process for STKLNK02 on 16 Aug 2002
17:21:29 SIBLCMBL: S : DONJ : 1200 : DJPOOL : 0150 : 200 : 3390 : swap
17:21:29 SIBLCMBL: CP LINK * 0150 0150 M
17:21:29 SIBLCMBL: CP LINK DONJ 1200 AS 1FFF RR
17:21:29 SIBLCMBL: SnapShot took 0.110 seconds to copy 200 cylinders
17:21:29 SIBLCMBL: S : DONJ : 1201 : DJPOOL : 0151 : 3000 : 3390 : boot
17:21:29 SIBLCMBL: CP LINK * 0151 0151 M
17:21:29 SIBLCMBL: CP LINK DONJ 1201 AS 1FFF RR
17:21:29 SIBLCMBL: SnapShot took 0.292 seconds to copy 3000 cylinders
17:21:29 SIBLCM78: CP DEFINE CTCA OEBO USER TCPIP
17:21:29 SIBLCM78: CP DEFINE CTCA OEB1 USER TCPIP
17:21:29 SIBLCM78: CP COUPLE OEBO TCPIP OF72
17:21:29 SIBLCM78: CP COUPLE OEB1 TCPIP OF73
17:21:29 SIBLCM78: Virtual CTCs coupled with TCPIP
17:21:29 SIBLCMBL: CP QUERY VIRTUAL STORAGE
17:21:29 SIBLCMBL: STORAGE = 32M
17:21:29 SIBLCMBL: CP IPL 151 CLEAR
hwc low level driver: can write messages
hwc low level driver: can not read state change notifications
hwc low level driver: can read commands
hwc low level driver: can read priority commands
Linux version 2.4.7-SuSE-SMP (root@k_deflt.suse.de) (gcc version 2.95.3 20010315 (SuSE)) #
We are running under VM
This machine has an IEEE fpu
On node 0 totalpages: 8192
zone(0): 8192 pages.
zone(1): 0 pages.
zone(2): 0 pages.
Internet
```

Zero to Server in 21 Seconds




SnapVantage - Microsoft Internet Explorer provided by MSN

```

File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites Media History
Address
Google Search Web Search Site Page Info Up Highlight
..done
Sending all processes the KILL signal...
..done
INIT: Going single user
INIT: Sending processes the TERM signal
Give root password to login:
###:
/root/stk/chgident.sh ctlnx01 stklnx02 129.80.129.156 129.80.129.152 129
<ctlnx01 stklnx02 129.80.129.156 129.80.129.152 129.      OOOOOOOOOOOOOO
<9.156 129.80.129.152 129.80.123.254 129.80.129.138      OOOOOOOOOOOOOO
<0.123.254 129.80.129.138 129.80.5.148 129.80.16.241    OOOOOOOOOOOOOO
Old Hostname = ctlnx01
New Hostname = stklnx02
Old Host IP = 129.80.129.156
New Host IP = 129.80.129.152
Old Peer IP = 129.80.123.254
New Peer IP = 129.80.129.138
Old DNS IP = 129.80.5.148
New DNS IP = 129.80.16.241
Distribution = suse
SED CMD = /bin/sed -e 's/129.80.129.156/129.80.129.152/g' -e 's/ctlnx01/stklnx02/g' -e 's
###:
passwd
New password:
Re-enter new password:
Password changed
###:
perl /root/stk/init_check.pl
INIT: Switching to runlevel: 3
INIT: Sending processes the TERM signal
###:

STKLNx02 initialized with IP address 129.80.129.152 and root password sz37Y8cG
SUSE72 clone operation completed in 21 seconds

```


[Top](#)

Internet

Linux Models



- Supported Distributions
 - Redhat 7.2
 - SuSE 7.0 and 7.2
 - TurboLinux 6.5
- Clone Minidisk Storage
 - Determine R/O vs. R/W strategy
 - Static allocation
 - Dynamic allocation via storage pools
 - DIRMAINT, VM:DIRECT, VM:SECURE

Model Installation and Customization



- Define backup minidisks
 - Mdisk 100 – development, customization
 - Mdisk 200 – clone image
 - Mdisk 300 – clone backup
- Install and Customize Linux on Mdisk 100
 - SnapShot backup 100 to 300 throughout
 - **SIBVMRVA SNAP 100 300**
 - Copy SnapVantage script directory to /root
 - Set the default runlevel to 1
 - Shutdown Linux
 - SnapShot 100 to 200

Linux Server Models



*

* **Linux**

Web Menu

* **Server Name**

Option Name

*

SUSE70	=	SuSE 7.0 Web
SUSE72	=	SuSE 7.2 Web
REDHAT72	=	RedHat 7.2 Development (no apache)
SUSEWEB1	=	SuSE Web + /home
SUSE101	=	SuSE Linux S/390 101
SUSE221	=	SuSE Linux S/390 221 (advanced)
SUSEDDB1	=	SuSE Oracle Database
SUSEPS1	=	SuSE Print Server
SUSEDNS1	=	SuSE DNS Server

Model Template File



- Model IP, DNS addresses, root password
- Boot address
- Virtual storage
- New root password
- Expiration date
- Autolog priority
- Minidisk definitions

Model Minidisk Definitions



* Linux device definitions.

*

* Action codes: S - SnapShot

* I - Instant Format

* T - TDISK (dynamically defined)

* V - VDISK (dynamically defined)

* D - DDR

* F - Format (CMS Format using SIBFMTSS)

* U - User defined (no action taken)

*

```
*          Model          Storage          Linux Server
* Action Userid      Vdev      Pool      Mdisk      Size      Type      Description
-LDD (
  V :                :          :          : 150 : 250000 :          : swap      ;
  S : DONJ           : 1201 : DJPOOL : 151 :   3000 : 3390 : boot      ;
  I :                :          : DJPOOL : 152 :    500 : 3390 : /home -c ;
)
```


Clone Web Page


SnapVantage - Microsoft Internet Explorer provided by MSN

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites Media History

Address Go Links

Google Search Web Search Site Page Info Up Highlight

[Home](#)
[Clone](#)
[Admin](#)
[VM Server](#)

[SVAA](#)
[Monitor](#)
[Login](#)
[Logout](#)

Model Parameters for SUSEWEB1

Root Password	Server Name	IP	Peer	DNS
not4you	ctlnx01	129.80.129.156	129.80.123.254	129.80.5.148

New Root Password:
 Autolog Priority:
 Boot Device:
 Memory MB:
 Expiration Date:

#	Request	Model		Storage		Linux Server		Description	
		Userid	Vdev	Pool	Mdisk	Size	Type		
1	Vdisk				150	250000		swap	<input type="button" value="delete"/>
2	SnapShot	DONJ	1201	DJPOOL	151	3000	3390	boot	<input type="button" value="delete"/>
3	Instant Format			DJPOOL	152	500	3390	/home -c	<input type="button" value="delete"/>
4									<input type="button" value="delete"/>

Internet

Under the Hood



- Clone Requests from Web or CLI
- SnapVantage VM Server processes the requests
 - Uses CMS Multitasking Services
 - Allocates resources and autologs the Linux Clone
 - Secondary Console Facility
- Linux Clone
 - Performs minidisk initialization tasks
 - Boot Linux
 - Customize via commands sent from VM Server

That's only the tip of the Iceberg...



- Cloning is only the 1st step
 - Manage the Farm
 - Autolog the Linux servers at VM IPL
 - Shutdown the servers (en masse or individually)
 - Monitor their activity
 - Send Linux commands to one or more servers
- Use multiple SnapVantage VM servers
 - Linux Model development
 - One or more for Linux farms
- Use SnapShot

Contacts and Additional Information



Email: don_johnson@storagetek.com

Phone: USA 303.673.5383

SnapVantage product information

<http://www.storagetek.com/prodserv/products/software/svan/>

