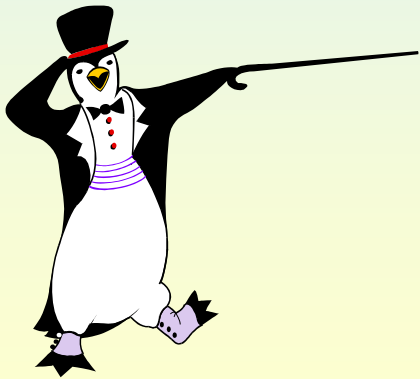


Linux z/900 at Salomon Smith Barney



Doctor Robinson

VM/Linux System Programmer

doctor.robinson@ssmb.com

Introduction

SSMB is a member of [citigroup](#), corporate & investment bank located in the financial district of lower Manhattan. A Task Force Team was created consisting of VM/Linux, Unix, Communication, Security and Application personnel to evaluate Linux on S/390, porting of applications, creating new applications, security, backup / restore, and connectivity. At this time we have z/VM running 48 guest images on IFL processors. Linux S/390 was chosen to provide a stable and reliable infrastructure for Intranet, Internet, and vendor application such as DB2-connect , Websphere, SAMBA, CICS/MQ, and in house applications, as well as gateway and print server consolidation.



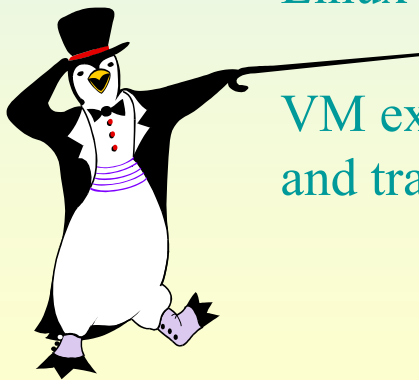
Why z/VM

VM provides multi-image support and can run hundreds of Linux guests simultaneously.

Using IUCV or virtual CTCA devices, VM supports very high-performance networking among Linux guests.

These same facilities can be used to establish high-speed connections to VM's TCP/IP stack.

Data-in-memory support, provided by VM Virtual Disks in Storage and Minidisk caching, provides transparent, high-speed data access for Linux guests.

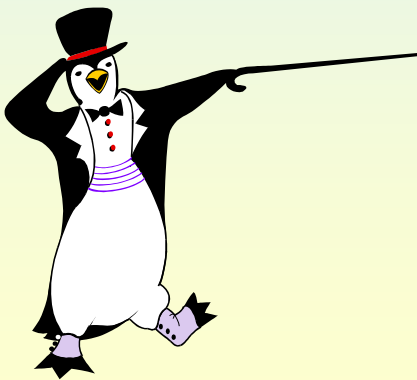


VM exploits expanded storage on behalf of Linux guests automatically and transparently.

Why SuSE Linux and IBM

IBM provided a supported marriage of Mainframe architecture and Open System Unix OS architecture.

IBM has demonstrated proven customer support mechanisms and LINUX is an universally accepted UNIX like Open System



Hardware / Software

Two IFLs

z/VM 4.1.0

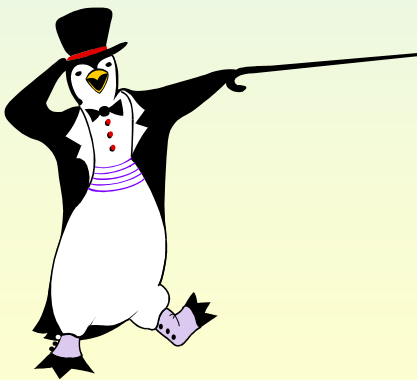
Linux Images as Guest

6 Paging Volumes 3390-3

Linux Images DASD allocations.

mdisk 193 3390 1 3338 volser mr (Almost everything

mdisk 193 3390 1 2000 volser mr (Network Support



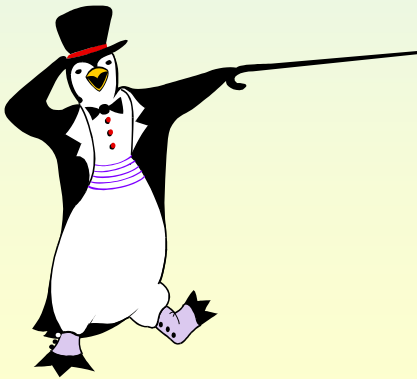
Configuration and Implementation Experiences

Mainframes

9672-Z27, 9672-Z57 and 2064-1C8 with
PPRC and SRDF Support for DR, IUCV,
Virtual CTCs, and CIP Router Interfaces

Linux

SuSE 7.0 Network supported images
(instances)



CTC

Virtual CTCA

tcpip directory

SPECIAL 8800 CTCA

SPECIAL 8801 CTCA

profile tcpip

DEVICE DEV8800 CTC 8800

LINK HTCP8800 CTC 1 DEV8800

nnn.nn.nnn.n HTCP8800

HTCP8800 4096 0 255.255.255.252 nnn.nn.nnn.n

START DEV8800

linux01 profile

'DEF CTC 8800'

'DEF CTC 8801'

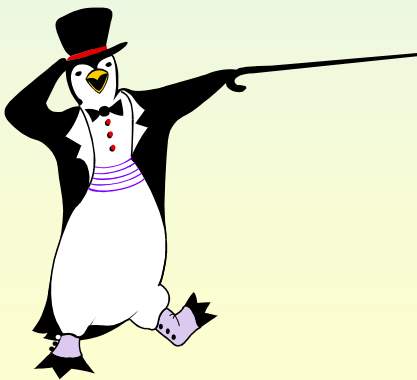
'couple 8800 to tcpip 8800'

'couple 8801 to tcpip 8801'

SAY 'FORMATING 192 V-DISK'

'exec vdisk exec a'

'I 193 CLEAR'



IUCV

linux01 z/VMdirectory

iucv allow

iucv any

profile tcpip

```
DEVICE DEV8802 IUCV 0 0 linux01
```

```
LINK HTCP8802 IUCV 0 DEV8802
```

```
nnn.nn.nnn.nn HTCP8802
```

```
HTCP8802 4096 0 255.255.255.252 nnn.nn.nnn.n
```

```
START DEV8802
```

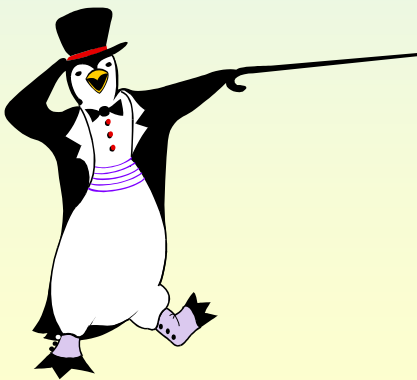
linux01 profile exec

```
'cp term chardel off /* to use @ in internet addresses */
```

```
SAY 'Formatting 192 V-DISK'
```

```
'exec vdisk exec a'
```

```
'I 193 CLEAR'
```



Performance

SWAP

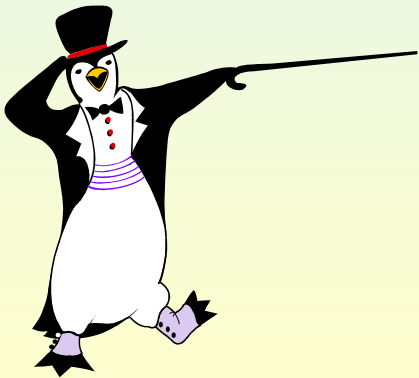
Linux01 z/VM directory

MDISK 192 FB-512 V-DISK 500000 M

```
linux01 script linux01.swap
```

```
mkswap /dev/dasda1
```

```
swapon /dev/dasda1
```



Web-Severs

linux01 z/VM directory

```
user linux01 linux01 512m 512m g 64
```

Cloning

DDR Linux image



```
/etc/linux.netsetup
```

```
ifconfig ctc0 inet nnn.nn.nnn.nn pointopoint nnn.nn.nnn.nn netmask  
255.255.255.0 up
```

```
/usr/sbin/routed -d /var/log/routed/log.`date +%b%d` &
```

Update files listed below

```
/etc/linux.netsetup (home grown)
```

```
/etc/hosts
```

```
/etc/HOSTNAME
```

```
/etc/smb.conf
```

```
/etc/route.conf
```

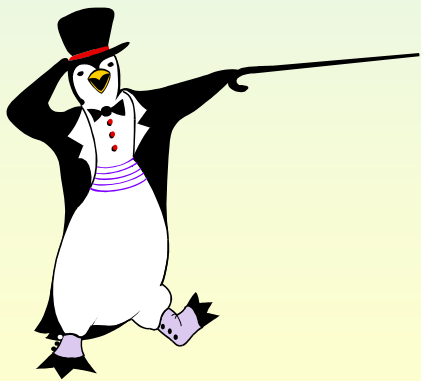
```
/etc/rc.config
```

```
/etc/httpd/httpd.conf
```

```
Execute SuSEconfig
```



Applications



DB2-Connect,
Multiple Intranet Web Sites,
SAMBA,
MTS,
Change Control,
Data Center Support,
Mainframe Storage,
Data Center Recovery

Web-browser

Apache HTTP Server - start page - Netscape

File Edit View Go Communicator Help

Back Forward Reload Home Search Netscape Print Security Shop Stop

Bookmarks Go to:

GEDI SSB Assist SSB Access



Welcome to SuSE Linux



SuSE Linux 7.0 (s390)

Host: linux106.es.smb.com, Kernel: 2.2.16 (s390)

Locally installed SuSE Documentation <ul style="list-style-type: none">SuSE Help PagesSuSE Support DatabaseDirectory /usr/share/doc/	The SuSE Website <ul style="list-style-type: none">SuSE Webserver (Germany)SuSE Webserver (USA)
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------

The Apache WWW Server

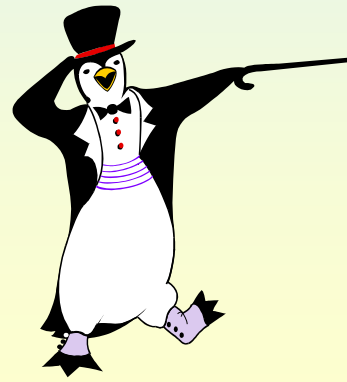
Apache/1.3.12 (Unix) (SuSE/Linux) mod_perl/1.24 PHP/3.0.17-dev

Documentation <ul style="list-style-type: none">Apache webserver documentationPHP Manual	Test and Example Pages <ul style="list-style-type: none">PERLPHP
--------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------



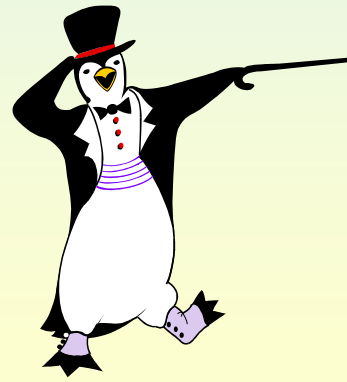
Document: Done

Start 3rdsess - E... 1171 - EXT... 1187 - EXT... Palm Desk... Inbox - Mic... Exploring - ... WyseTerm... Microsoft P... Apache ... 4:34 PM

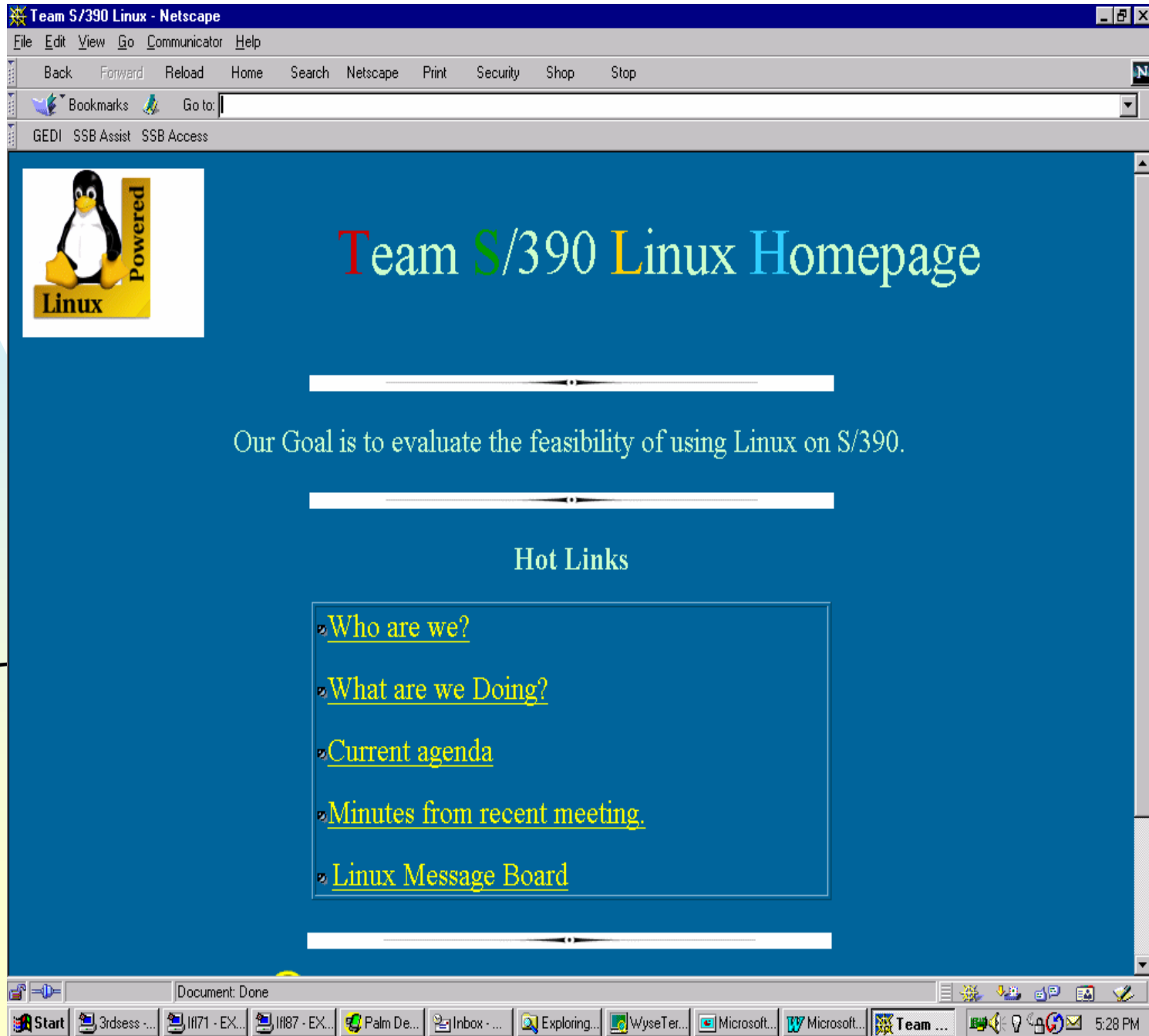


Web-browser

The screenshot shows a Netscape browser window titled "IBM HTTP Server - Netscape". The menu bar includes "File", "Edit", "View", "Go", "Communicator", and "Help". The toolbar contains "Back", "Forward", "Reload", "Home", "Search", "Netscape", "Print", "Security", "Shop", and "Stop". The address bar is empty, and the bookmarks bar shows "GEDI", "SSB Assist", and "SSB Access". The main content area features the IBM logo at the top left. Below it, the text reads "Welcome to the IBM HTTP Server powered by Apache". A sub-header states "Everything you need to start and use this server begins here...". A list of links includes "Configure server", "View documentation", and "Visit our Web site". On the right side of the page, there is a graphic showing two men, gears, and a pair of glasses.



Linux Application




Team S/390 Linux - Netscape

File Edit View Go Communicator Help

Back Forward Reload Home Search Netscape Print Security Shop Stop

Bookmarks Go to:

GEDI SSB Assist SSB Access



Team S/390 Linux Homepage

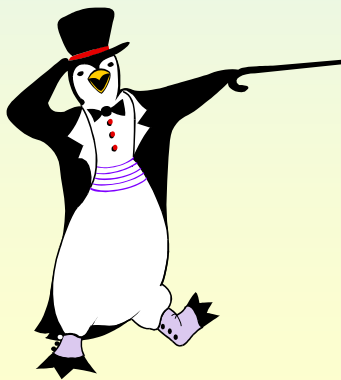
Our Goal is to evaluate the feasibility of using Linux on S/390.

Hot Links

- [Who are we?](#)
- [What are we Doing?](#)
- [Current agenda](#)
- [Minutes from recent meeting.](#)
- [Linux Message Board](#)

Document: Done

Start 3rdsess ... 11171 - EX... 11187 - EX... Palm De... Inbox - ... Exploring... WyseTer... Microsoft... Microsoft... Team ... 5:28 PM



Linux Application


Untitled Document - Netscape

File Edit View Go Communicator Help

Back Forward Reload Home Search Netscape Print Security Shop Stop

Bookmarks Location: h

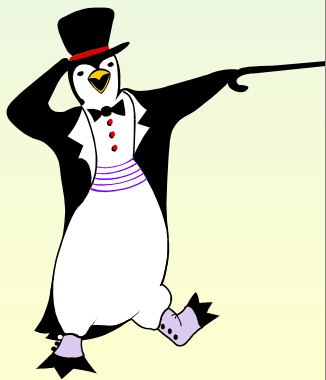
GEDI SSB Assist SSB Access

 Data Center Support

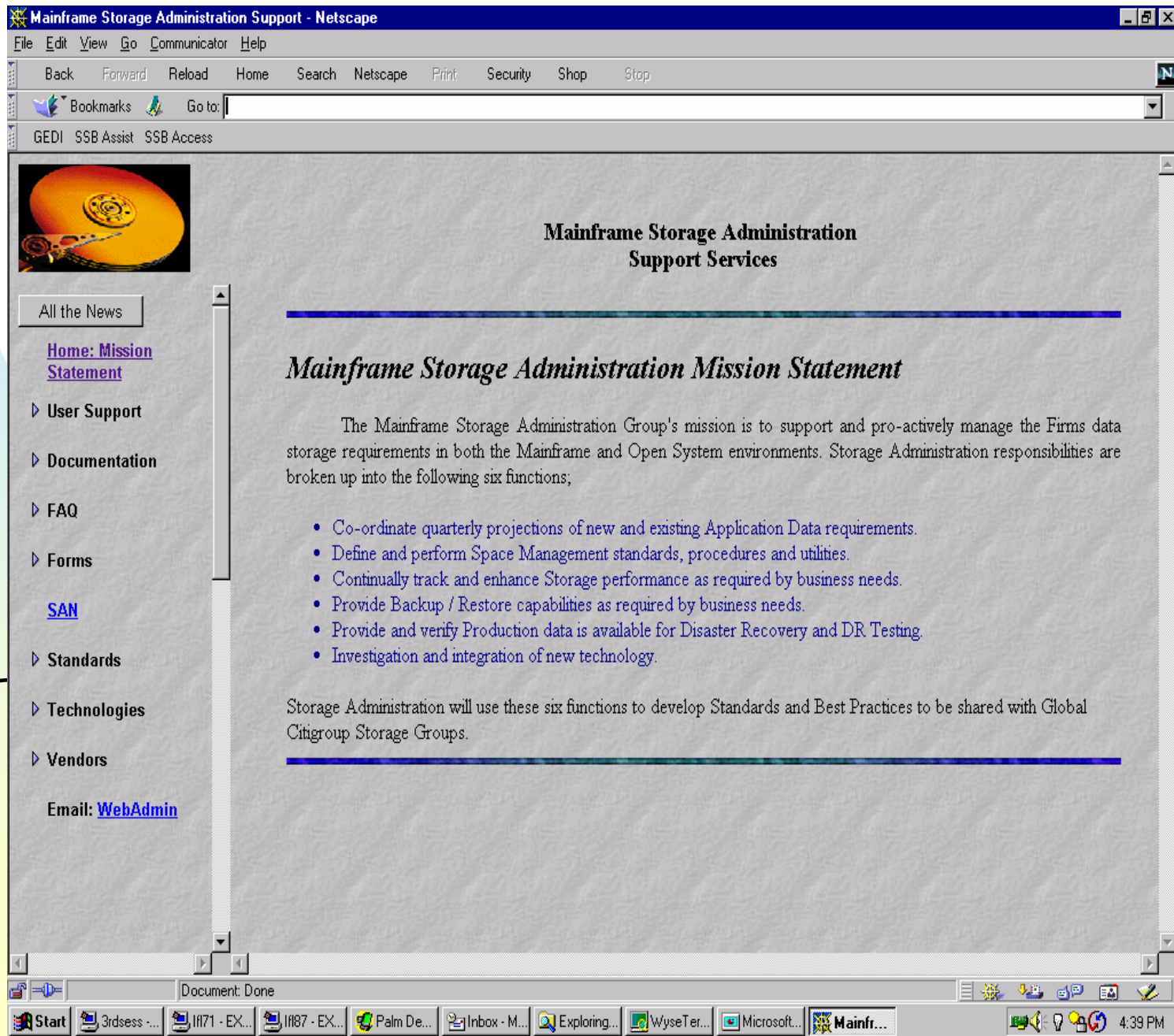
390 Greenwich Street Data Center

Hardware On-Call	390 MDF	Distributed Distribution Facility	3174 Configuration
Tape Pool	War Room	Equipment Pwr Up/Down Procedures	Filetek Optical
390 Tape Vaulting	STK Salomon Tape Vaulting	WEB Tape Vaulting	WEB Procedures
SAN Environment	EMC Alert Codes	HDS Alert Codes	IBM Shark DASD
390 HMC Configuration			

Start Palm D... 3rdsess... I171 - E... I187 - E... Inbox ... Explori... WyseT... eTrust... Control... Micros... Untit... 10:33 AM



Linux Application



Mainframe Storage Administration Support Services

[All the News](#)

[Home: Mission Statement](#)

▶ [User Support](#)

▶ [Documentation](#)

▶ [FAQ](#)

▶ [Forms](#)

[SAN](#)

▶ [Standards](#)

▶ [Technologies](#)

▶ [Vendors](#)

Email: [WebAdmin](#)

Mainframe Storage Administration Mission Statement

The Mainframe Storage Administration Group's mission is to support and pro-actively manage the Firms data storage requirements in both the Mainframe and Open System environments. Storage Administration responsibilities are broken up into the following six functions;

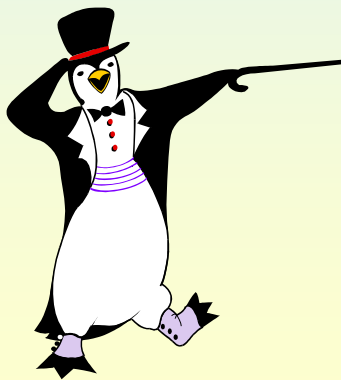
- Co-ordinate quarterly projections of new and existing Application Data requirements.
- Define and perform Space Management standards, procedures and utilities.
- Continually track and enhance Storage performance as required by business needs.
- Provide Backup / Restore capabilities as required by business needs.
- Provide and verify Production data is available for Disaster Recovery and DR Testing.
- Investigation and integration of new technology.

Storage Administration will use these six functions to develop Standards and Best Practices to be shared with Global Citigroup Storage Groups.

Document: Done

Start 3rdsess ... 1171 - EX... 1187 - EX... Palm De... Inbox - M... Exploring... WyseTer... Microsoft... Mainfr...

4:39 PM





390 Data Center Shark DASD - Netscape

File Edit View Go Communicator Help

Back Forward Reload Home Search Netscape Print Security Shop Stop

Bookmarks Location: <http://dchardware/2002web/sharkdasdpage.htm>

GEDI SSB Assist SSB Access

2105 C0E 2105 C2E 2105 C4E (Salomon)

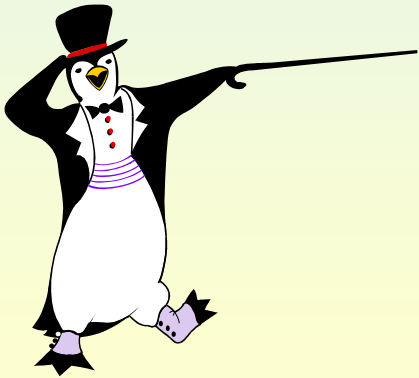
2105 C6E 2105 CAE

<http://dchardware/390DATACENTER/SharkDASD/2105C0E.jpg>

Start Palm... 3rds... I1871 ... I187 ... Inbo... Expl... Wys... eTru... Cont... Micr... X Micr... Rec... 39...

2:23 PM

IBM's DB2-Connect



```
tar file:  
s00810b.familyCD.tar
```

```
Untar file:  
tar -xvf s00810b.familyCD.tar
```

Tar file creates this Directory:

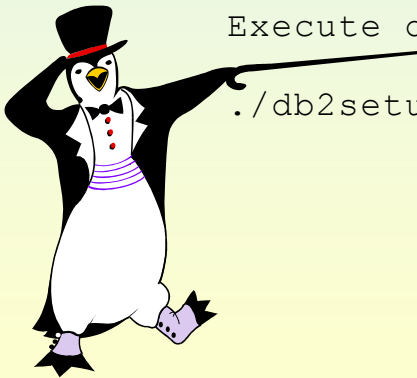
```
drwxr-sr-x   3 root      root          4096 Oct 12  2000 s00810b.familyCD
```

```
cd s00810b.familyCD
```

```
drwxr-sr-x   3 root      root          4096 Oct 12  2000 .  
drwx--x--x   9 root      root          4096 Jan 26  2001 ..  
drwxr-sr-x   6 root      root          4096 Oct 12  2000 db2  
-r-xr--r--   1 root      bin           4087 Oct 12  2000 db2_deinstall  
-r-xr--r--   1 root      bin          10187 Oct 12  2000 db2_install  
-r-xr-xr-x   1 root      root          5255 Oct 12  2000 db2setup
```

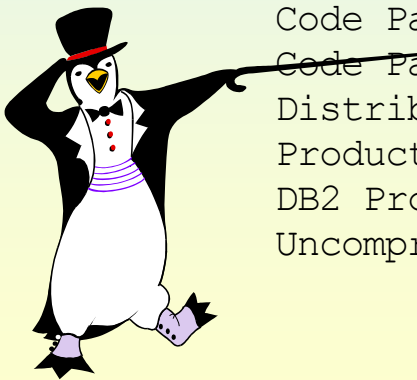
Execute db2setup:

```
./db2setup
```



Installation

DB2 Client	SUCCESS
Code Page Conversion Support - Uni Code Support	SUCCESS
Java Support	SUCCESS
DB2 Run-time Environment	SUCCESS
DB2 Communication Support - TCP/IP	SUCCESS
DB2 Communication Support - DRDA Application Server Administration Server	SUCCESS
DB2 Connect Support	SUCCESS
Replication	SUCCESS
Code Page Conversion Support - Japanese	SUCCESS
Code Page Conversion Support - Korean	SUCCESS
Code Page Conversion Support - Simplified Chinese	SUCCESS
Code Page Conversion Support - Traditional Chinese	SUCCESS
Distributed Join for DB2 Data Sources	SUCCESS
Product Signature for DB2 Connect Enterprise Edition	SUCCESS
DB2 Product Library (HTML) -- English	SUCCESS
Uncompress DB2 Product Library (HTML) -- English	SUCCESS



DB2 Services Creation

Fenced User

Create new group name	SUCCESS
Create new user name	SUCCESS
Set password for new user	SUCCESS

DB2 Instance

Create new group name	SUCCESS
Create new user name	SUCCESS
Set password for new user	SUCCESS

DB2 Instance Creation	SUCCESS
Create new entry in /etc/services	SUCCESS
Update DBM configuration file for TCP/IP	SUCCESS
Auto start DB2 Instance	SUCCESS
Start DB2 Instance	SUCCESS

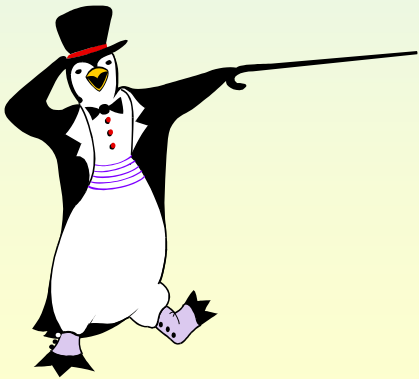
Administration Server

Create new group name	SUCCESS
Create new user name	SUCCESS
Set password for new user	SUCCESS
Administration Server Creation	SUCCESS
Start Administration Server	SUCCESS



Catalog Databases:

```
db2 catalog tcpip node CPUG remote db201.share.com server 4298
db2 catalog database db201 as db201 at node CPUG authentication dcs
db2 catalog dcs database db201 as DB201
```



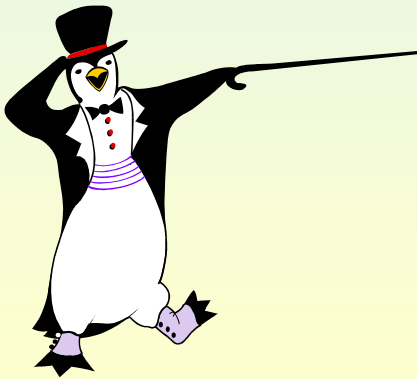
DB2-Connect User



Software required on workstation:

CAE, client application enabler
configured to point to databases.

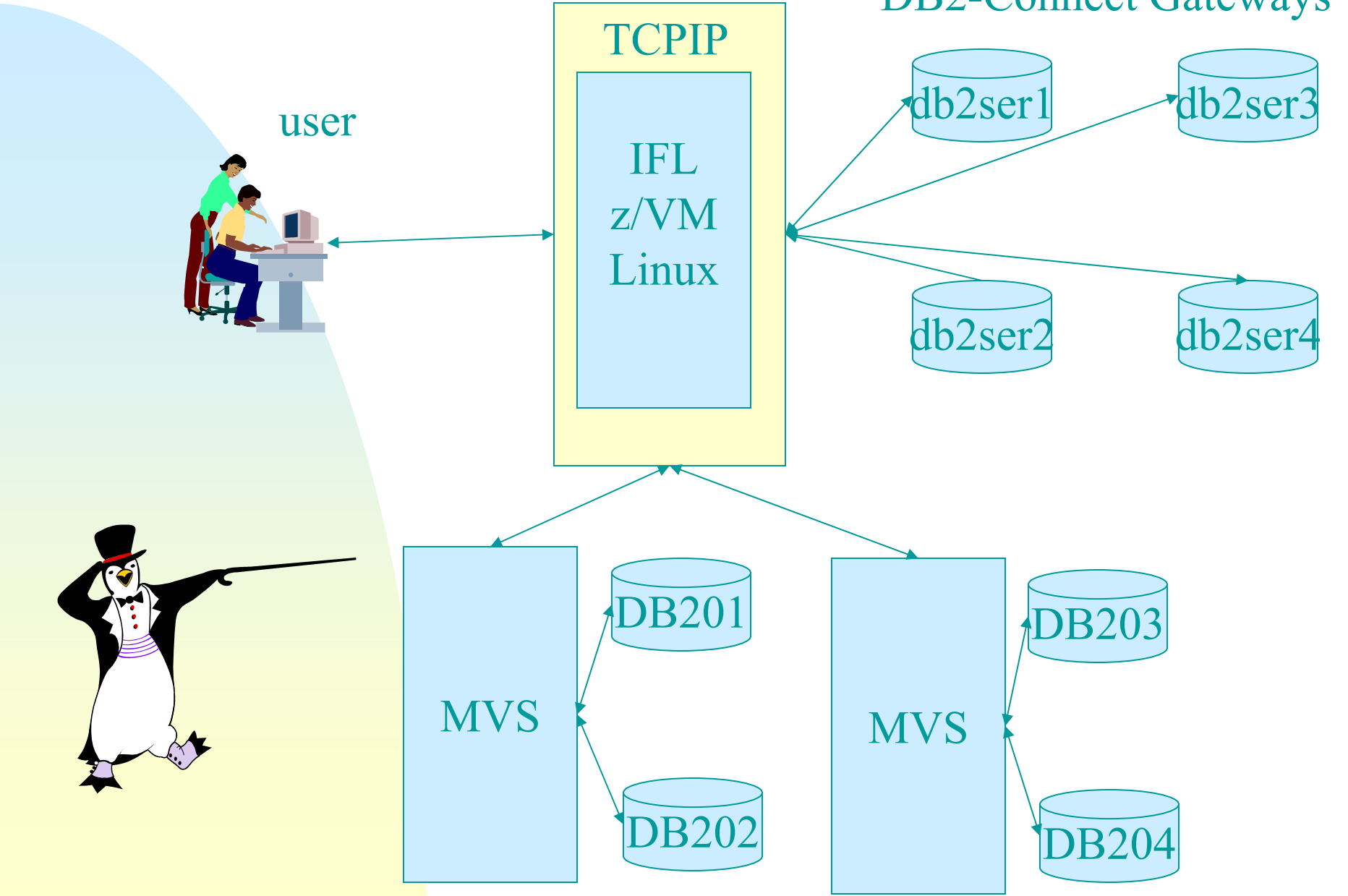
Middleware, Java, Business Objects,
Power Builder, Visual Basic, etc.



DB2-Connect Application

Linux Instances

DB2-Connect Gateways



Linux Application

Mainframe Technical Services Group Home Page - Netscape

File Edit View Go Communicator Help

Back Forward Reload Home Search Netscape Print Security Shop Stop

Bookmarks Location: <http://mts/>

GEDI SSB Assist SSB Access

mts Mainframe Technical Services

Home Software Support Operations InfoCenter News

Search

Local Sites

refresh this box (frame)
click to bookmark
click to save here (Ctrl+D)

Related Sites

Current Visitor Count

Welcome Message



Welcome to the home page of the Mainframe Technical Services Group. Our mission is to support the Citigroup Corporate Investment Bank (formerly Salomon Smith Barney) in the Systems / back office and trading areas. It includes installation, maintenance, upgrade, support, and operation / execution of both software programs / data bases and hardware / physical machine activities.

As reflected in the setup and navigation of our site, our duties and responsibilities can be organized as follows, both in terms of software / products and customer / user support:

- Hardware -- CPU, disk storage, tape, and other peripherals,
- Communications -- VTAM, TCP/IP, data transfer,
- Data bases -- design, implementation, and maintenance -- IMS, DB2, IDMS,
- Messaging and transaction servers -- CICS, MQ, DRM, IMS, Websphere,
- Operating systems -- MVS, VM, Linux, and
- Operations -- mainframe, automation, disaster recovery

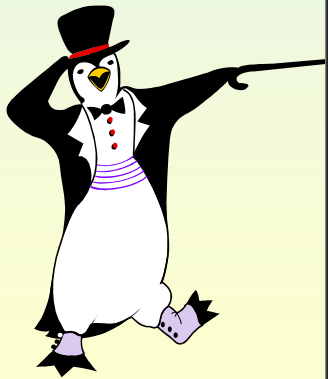
News & Events:

- 20 Feb 2002: These updated web pages (with bookmark functionality) currently work best under Internet Explorer (IE)
- 26 Jan 2002: All work requests should now be processed using the eworkflow Database Support Request form found under the "local sites" pulldown. User login (the first time) is required. Thank You

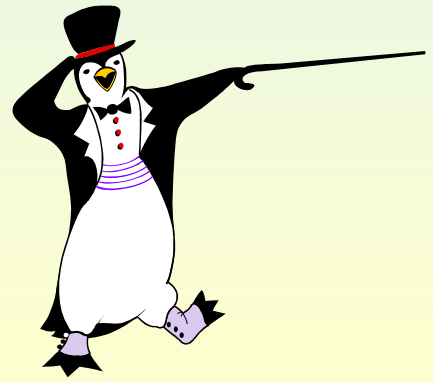
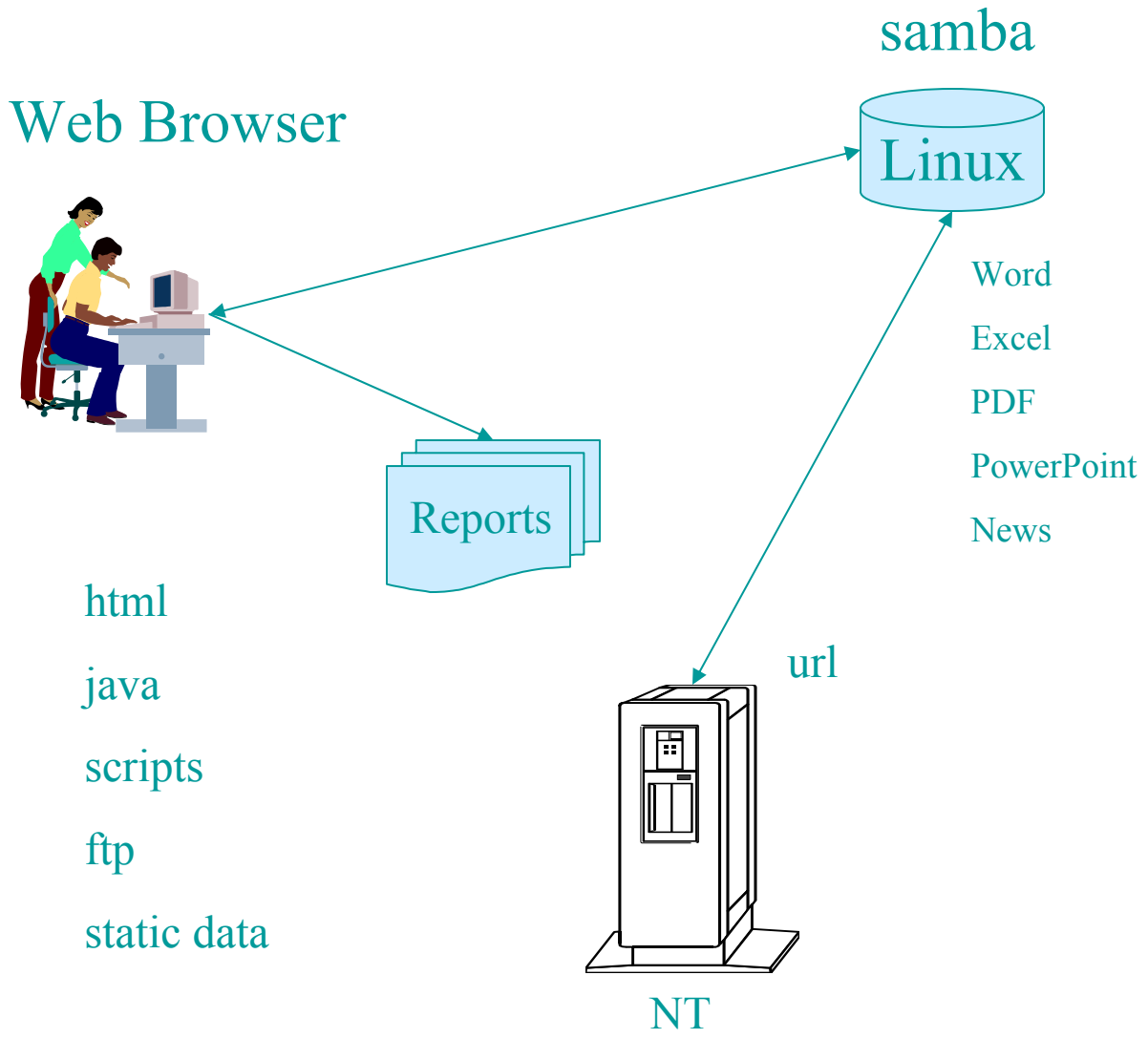
Document: Done

Start Palm... 3rds... 1171 ... 1187 ... Inbo... Expl... Wys... Acro... ITF WS... eTru... Sec... Micr... Mai...

2:32 PM



Mainframe Technical Services



Linux Application




Change Control Home Page - Netscape

File Edit View Go Communicator Help

Back Forward Reload Home Search Netscape Print Security Shop Stop

Bookmarks Go to:

GEDI SSB Assist SSB Access

 SALOMON SMITH BARNEY
CHANGE CONTROL

Web Mainframe Client/Server

NEW! Welcome to Change Control

[Home](#)

[Web Change Control](#)

[Client Server Change Control](#)

[Mainframe Change Control](#)

[Mainframe Contacts](#)

[Web & Client/Server Contacts](#)

[GDS](#)

[GEDI](#)

[Time Reporting System](#)

What's new

- [Linux Change Management](#)
- [Manage And Deploy System - MADS](#)
- [--C.A.M.S.--](#)
- [CICS Abends Online Database](#)
- [Change Control Mission Statement](#)
- [Standards Variance Request Form](#)
- [Web Request Form](#)

[Login](#)

- This site provides application developers with additional resources for using PVCS Version Manager or ChangeMan and enhances the support that the Change Control teams provide.
- The site is divided into three major areas: [Web Change Control](#), [Mainframe Change Control](#) and [Client Server \(NT\) Change Control](#). These sections can be accessed by selecting the link located above, or from the navigation bar at the left.
- If you need additional assistance please contact your Change Control Group using the contact list on the left.

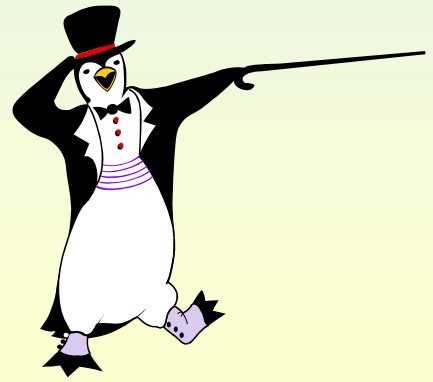
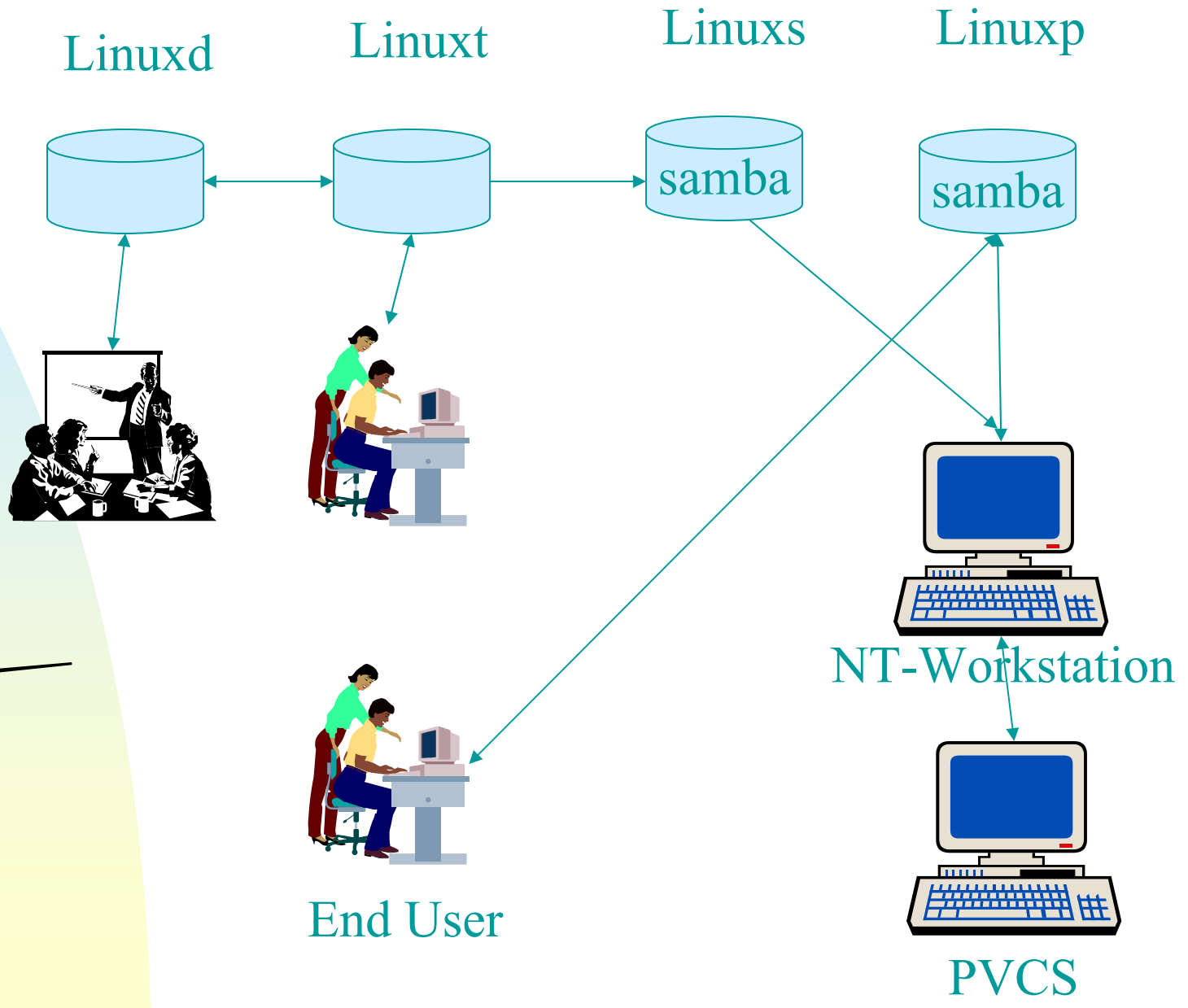
Salomon Smith Barney is a service mark of Salomon Smith Barney Inc.
© 2000 Salomon Smith Barney Inc. Member SIPC. Please send your feedback to [Webmaster](#).

SALOMON SMITH BARNEY
A member of citigroup

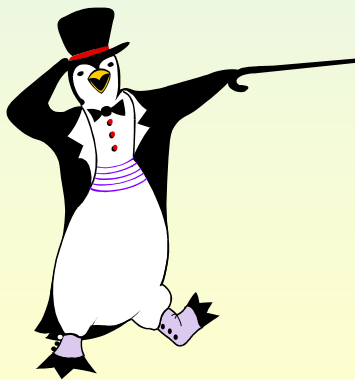
Document: Done

Start 3rdsess ... 1171 - EX... 1187 - EX... Palm De... Inbox - ... Exploring... WyseTer... Microsoft... Microsoft... Chang... 5:29 PM

Change Control



Linux Application

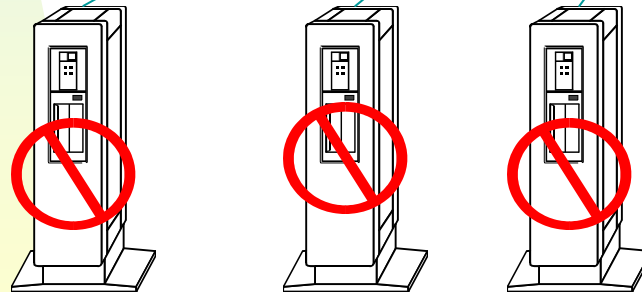
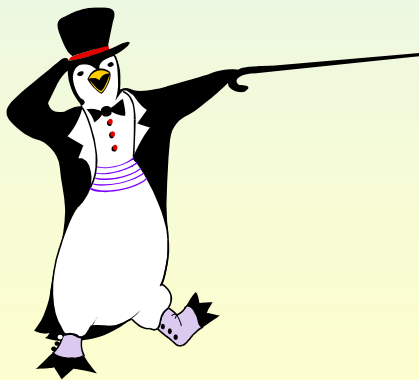


The screenshot shows a Netscape browser window with the title "Mainframe Disaster Recovery Home Page (NY) - Netscape". The address bar shows "http://linxp10f/". The page content includes a small penguin icon at the top center, followed by a horizontal line. Below the line, there is a block of text enclosed in asterisks: "***** Welcome to Salomon Smith Barney *****" and "***** Data Center Recovery Linux Production Image *****". Underneath this, the text "Sitename: linxp10f.es.ssb.com" is displayed. The main content area features three green underlined links: "SSB Operations Turnover (as taken at 07:15 each morning)", "CGTI NA Data Center Reporting", and "Reports Transmissions". A second horizontal line is located below the links. The browser's status bar at the bottom shows "Document: Done". The Windows taskbar at the very bottom contains various application icons, including Start, Palm..., 3rds..., I1171 ..., I1187 ..., Inbo..., Expl..., Wys..., eTru..., Cont..., Micr..., Rec..., and Mai..., along with a system tray showing the time as 1:57 PM.

Data Center Recovery

z/900/IFL Running z/VM 4.1.0

Ported Applications
from Sun Machines



Sun Machines

Linux S/390 Access



The screenshot shows the KDE Control Center window on a Linux S/390 system. The window title is "KDE Control Center" and it has a menu bar with "File", "Options", and "Help". The left sidebar contains a tree view of system settings categories: Applications (Login Manager, File Manager, Web browser, Panel), Desktop (Background, Borders, Colors, Fonts, Desktop Icons, Theme Manager, Language, Screensaver, Style), Information, Input Devices, Keys, Network, Sound, and Windows. The main pane displays system information:

KDE Version:	1.1.2
User:	root
Hostname:	linxt102
System:	Linux
Release:	2.2.16
Version:	#1 SMP Wed Nov 8 10:57:03 GMT 2000
Machine:	s390

Below the system information is a banner for "the KDE desktop environment" featuring a large stylized "K" and a small image of a computer monitor. The desktop background is blue with icons for Trash, Templates, and Autostart. The taskbar at the bottom shows the Start button, several application icons, and the system tray with the date and time: "Fri 13:49 Jan 04 1:49 PM".

Linux S/390 Access



```
WyseTerm linxt10d [199.67.208.53]
File Edit Settings Connection Help
Welcome to SuSE Linux 7.0 (s390) - Kernel 2.2.16 (0).
linxt10d login: root
Password:
You have new mail in /var/spool/mail/root.
Last login: Mon Jan 14 16:57:27 on console
*
* Salomon Smith Barney SuSE Linux 7.0 System For System Programming...
*
linxt10d:~ #
```

Find Remove Prev Screen PF1 PF3
Insert Here Select Next Screen PF2 PF4

Connected To linxt10d [199.67.208.53] VT320 NUM 10,14 00:17

Start 3rdsess... IH71 - E... IH87 - E... Palm D... Inbox - ... Explori... Wyse... Micros... Source... WY Micros...

5:07 PM

Linux z/900 at Salomon Smith Barney 2002+

Use Linux to provide reliable and
stable services for SSMB
infrastructure.

