



# Open Source Software for NonStop Servers: User presentation.

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# NonStop + Open Source

- Higher productivity through Unix/linux like environment.
- 200+ Open Source ready to run out of the box on S series and NonStop Integrity.
- Porting time and effort dramatically reduced.
- “Runtime” Open Source opening a wide range of applications to run on NonStop without porting efforts.

# Agenda

- Refresh
  - Get Started: Discover, download and run
- The latest new features
  - Open Source available on Itanium
  - Packages and features
  - Recompiling is easy
- Integration: OSS and Open Source.
- Solutions, solutions, solutions
  - Samba
  - Python
  - Openssh



# Refresh: Getting started.

- Download Open Source from:
  - ITUG: <https://www.itug.org/secure/ituglib/user/index.cfm?>
  - HP: <http://opensource.hp.com/nonstop/>
  - Internet: Java, Perl, Php or python based Open Source.
- ITUG and HP downloads are delivered as file.tar.z
  - .z: You can use winzip, gzip or jar.
  - .tar: use pax or tar utilities in OSS
- Extract the download under / and read:  
[/usr/local/Floss/<package>/README\\_FLOSS](#)
- Your software is ready to use!
  - No need to run Configure or make

# Getting started: Demo

```
BRUTUS
File Edit Settings Help
/home/roland/floss/downloads: pwd
/home/roland/floss/downloads
/home/roland/floss/downloads: ls -l
total 7008
-rw-rw-rw- 1 SUPPORT.ROLAND SUPPORT 3587825 Sep 15 16:59 nse-wget.tar.Z
/home/roland/floss/downloads: id
uid=5262(SUPPORT.ROLAND) gid=20(SUPPORT)
/home/roland/floss/downloads: uncompress nse-wget.tar.Z
/home/roland/floss/downloads: cd /
/: su
Password:
#mkdir /usr/local
#exit
/: tar xof /home/roland/floss/downloads/nse-wget.tar
/: cd -
/home/roland/floss/downloads
/home/roland/floss/downloads: export http_proxy="http://proxy.compaq.com:8080"
/home/roland/floss/downloads: PATH=/usr/local/bin:$PATH
/home/roland/floss/downloads: wget http://ituglib.xid.com/content/nse-bash.tar.Z
--17:09:52-- http://ituglib.xid.com/content/nse-bash.tar.Z
=> `nse-bash.tar.Z'
Resolving proxy.compaq.com... done.
Connecting to proxy.compaq.com[16.110.71.248]:8080... connected.
Proxy request sent, awaiting response... 200 OK
Length: 6,122,935 [application/x-compress]

100%[=====] 6,122,935 1.12M/s ET
17:09:58 (1.12 MB/s) - `nse-bash.tar.Z' saved [6122935/6122935]

/home/roland/floss/downloads: █
```

nse = Itanium  
(nsr=mips)

I ftp this package  
to OSS

Need SUPER.SUPER  
to create /usr/local

Allow wget to be  
found

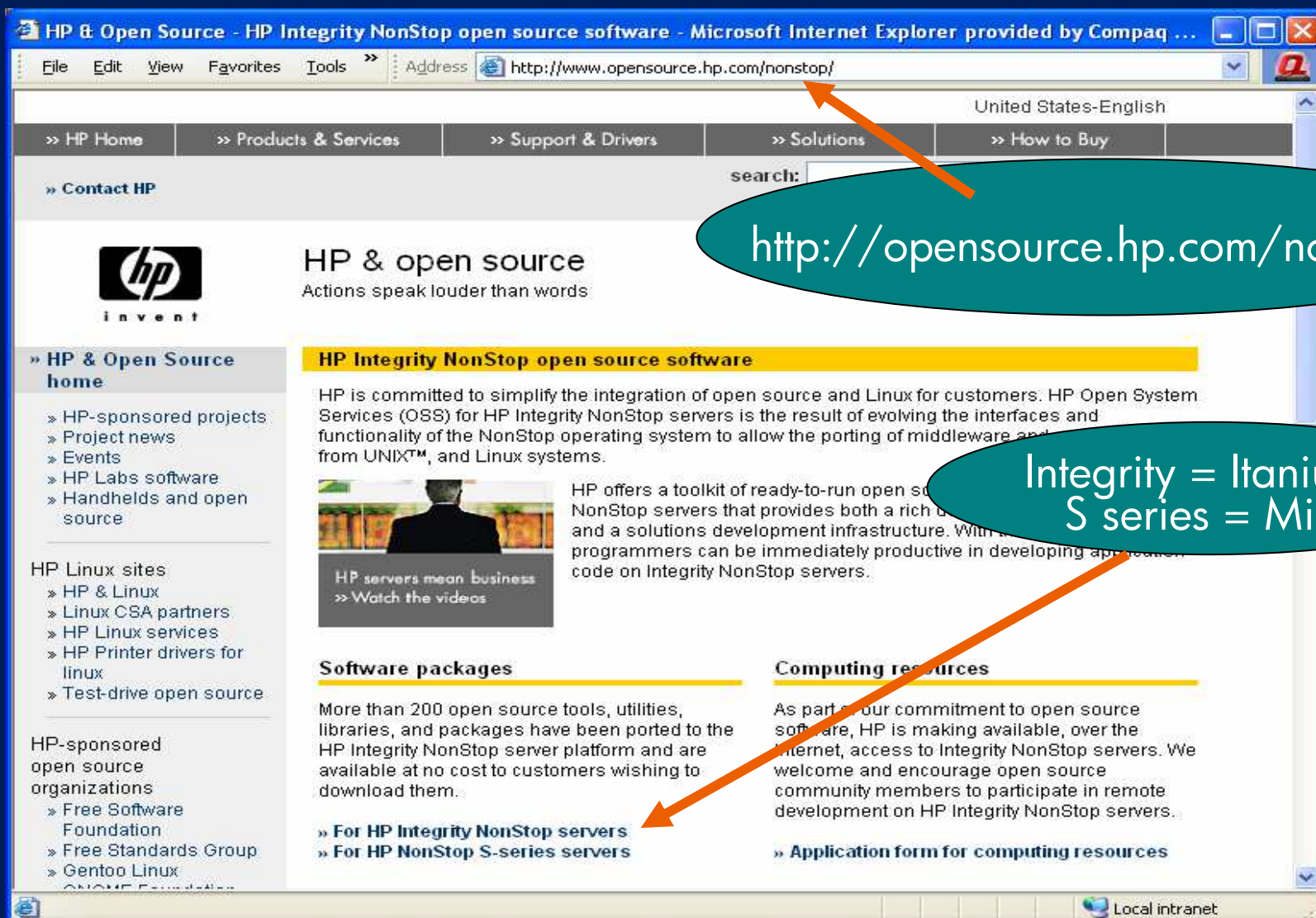
Now using wget to  
download more  
Open Source

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# HP NonStop Open Source page



HP & Open Source - HP Integrity NonStop open source software - Microsoft Internet Explorer provided by Compaq ...

File Edit View Favorites Tools Address <http://www.opensource.hp.com/nonstop/>

United States-English

» HP Home » Products & Services » Support & Drivers » Solutions » How to Buy

» Contact HP search:

**HP & open source**  
Actions speak louder than words

**HP Integrity NonStop open source software**

HP is committed to simplify the integration of open source and Linux for customers. HP Open System Services (OSS) for HP Integrity NonStop servers is the result of evolving the interfaces and functionality of the NonStop operating system to allow the porting of middleware and applications from UNIX™, and Linux systems.

HP offers a toolkit of ready-to-run open source applications for HP Integrity NonStop servers that provides both a rich set of tools and a solutions development infrastructure. With this toolkit, programmers can be immediately productive in developing applications that run on HP Integrity NonStop servers.

**Software packages**

More than 200 open source tools, utilities, libraries, and packages have been ported to the HP Integrity NonStop server platform and are available at no cost to customers wishing to download them.

» For HP Integrity NonStop servers  
» For HP NonStop S-series servers

**Computing resources**

As part of our commitment to open source software, HP is making available, over the Internet, access to Integrity NonStop servers. We welcome and encourage open source community members to participate in remote development on HP Integrity NonStop servers.

» Application form for computing resources

**HP & Open Source home**

- » HP-sponsored projects
- » Project news
- » Events
- » HP Labs software
- » Handhelds and open source

**HP Linux sites**

- » HP & Linux
- » Linux CSA partners
- » HP Linux services
- » HP Printer drivers for linux
- » Test-drive open source

**HP-sponsored open source organizations**

- » Free Software Foundation
- » Free Standards Group
- » Gentoo Linux
- » GNOME Foundation

<http://opensource.hp.com/nonstop>

Integrity = Itanium  
S series = Mips



# 200 Open Source on S & NS Series

## GUI apps

X11  
Samba  
vnc  
Gvim  
LPRng

## Editors

Vim  
nano  
Emacs  
ed

## Security

Openssl  
Openssh  
sudo  
Gnupg  
stunnel

## Productivity

bash  
cscope  
wget  
findutils

## Dev tools

dmalloc  
cvs  
floss  
make

## App servers

Apache  
Zope

## Languages

Perl  
Python  
ruby  
php



# Floss package latest features

- Floss 0.7
- Makes recompiling and porting very easy.
- Provides a wrapper macro “cc” around c89, allowing configure to work.
- Provides wrapper functions for common calls differences.
- Provide scripts to automate porting tasks
- Wrappers and scripts documented in a Porting Guide white paper

# Active community

- ITUG Special Interest Group "Open SIG"
  - register at [www.itug.org](http://www.itug.org)
  - Now regroups Java, OSS and Open Source interests.
- You can still also use the Tandem Newsgroup:
  - [news:comp.sys.tandem](mailto:news:comp.sys.tandem)
- Remember Open Source is often not supported but you can get help in many various ways (FAQ, Newsgroup, Project page, ...).
- NED/GMCSC supported Open Source:
  - NonStop XML Parser = Apache Xerces C++ 2.4.0
  - NonStop Fast XML Parser = Expat 1.95.7
  - NonStop Soap Client = gSOAP 2.6
  - NS/JSP = Apache Tomcat
  - DNS 9.x = BIND 9.3.0

# Open Source releases

- Latest packages.
  - Apache 2.0 -> 2.2
  - Perl 5.8
  - Samba 2 & 3
  - Vnc 3.3.7
  - Python 2.4.2
  - JBoss 4.0.3
  - Php 4.3.10
  - mySql 4.1.14
  - Openssl and Openssh performance improvements and fixes.
  - inetutils

# Recompiling is easy!

- Open Source packages are now compiled with c89.
- This means you can recompile yourself Open Source already ported very easily.
- The Floss package already includes the necessary flags needed for all packages.
- Specific, per packages, flags also available in a Makefile associated which makes recompiling as easy as typing:  
    make <package name>

# Recompiling Open Source steps:

- Install: Floss, GNU awk, GNU make, Textutils.
- Set your ENV:  
`export PATH=/usr/local/bin:$PATH`
- Install the Floss Makefile into /usr/local/Floss  
`cd /usr/local/Floss/floss-0.7 ; make install`
- Recompile the target Open Source:  
`cd /usr/local/Floss`  
`make hello`

# When do I need to recompile?

- **You don't!** In most cases packages are ready to use.  
**No need to run Configure or make.**
- You need to recompile when you install Open Source on older RVUs (ie pre-H06.nn). Because Open Source take advantage of functions introduced in H06.nn.
- When you run Open Source on non IEEE Floating point processors (S70000).
- When you want to add a specific module to the existing port that needs a recompile.

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# Integration into OSS

- If you want minimum impact on the OSS behavior, place /usr/local/bin at the end of the PATH:  
`export PATH=$PATH:/usr/local/bin`
- If placing /usr/local/bin at the beginning of the PATH:  
`export PATH=/usr/local/bin:$PATH`  
Then Open Source commands will be used instead of OSS commands (e.g. if you install grep from Floss).
- Most Open Source can be installed as a regular user. This makes sure you won't alter any existing system directory or settings.



# Integration into OSS: Documentation

- Open Source man(ual) pages are often delivered in `/usr/local/man`.
- But the OSS man commands also scans other directories by default: 

Default search order:

```
/usr/share/man/manX  
/usr/local/man/manX  
/usr/share/man/catX  
/usr/local/man/catX
```

- So if you install OpenSource “grep”, man will find the OpenSource grep man page first:
  - **`/usr/local/man/man1/grep.1` <-- Open Source grep**
  - **`/usr/share/man/cat1/grep.1` <-- OSS grep**
- Solution: Use MANPATH:  
ie: to access only OSS commands documentation:
  - Permanent: **`export MANPATH=/usr/share/man`**
  - Temporary: **`man -M /usr/share/man <man page>`**
- G06.27 search order corrected in the man documentation
  - It was incorrectly documented before.

# Integration into OSS: Documentation

- A possible second issue is that OSS man supports only ASCII man pages.

*/home/roland [2145]: man grep  
Nroff/troff is not currently installed, this must be  
installed in order to use formatted man pages.*

- To support those formats you can:
  - Install the OpenSource utility groff and create a symbolic link /bin/nroff to point to /usr/local/bin/nroff:  
**ln -s /usr/local/bin/nroff /bin/nroff**
  - Install OpenSource man:  
Package Man\_db  
(requires: Grep, Groff, Gzip, Less, Sed, Textutils.)

# Agenda

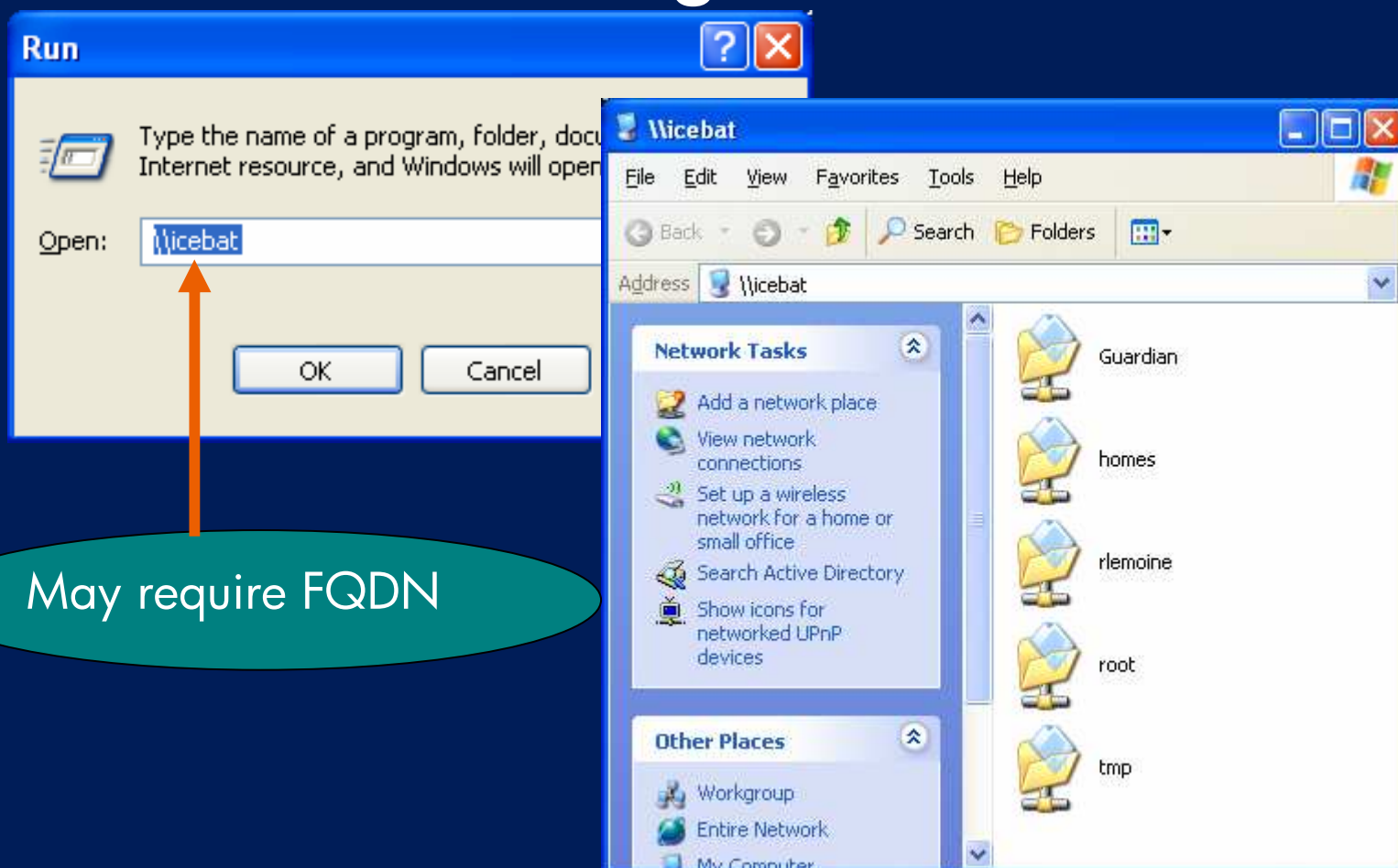
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# Samba

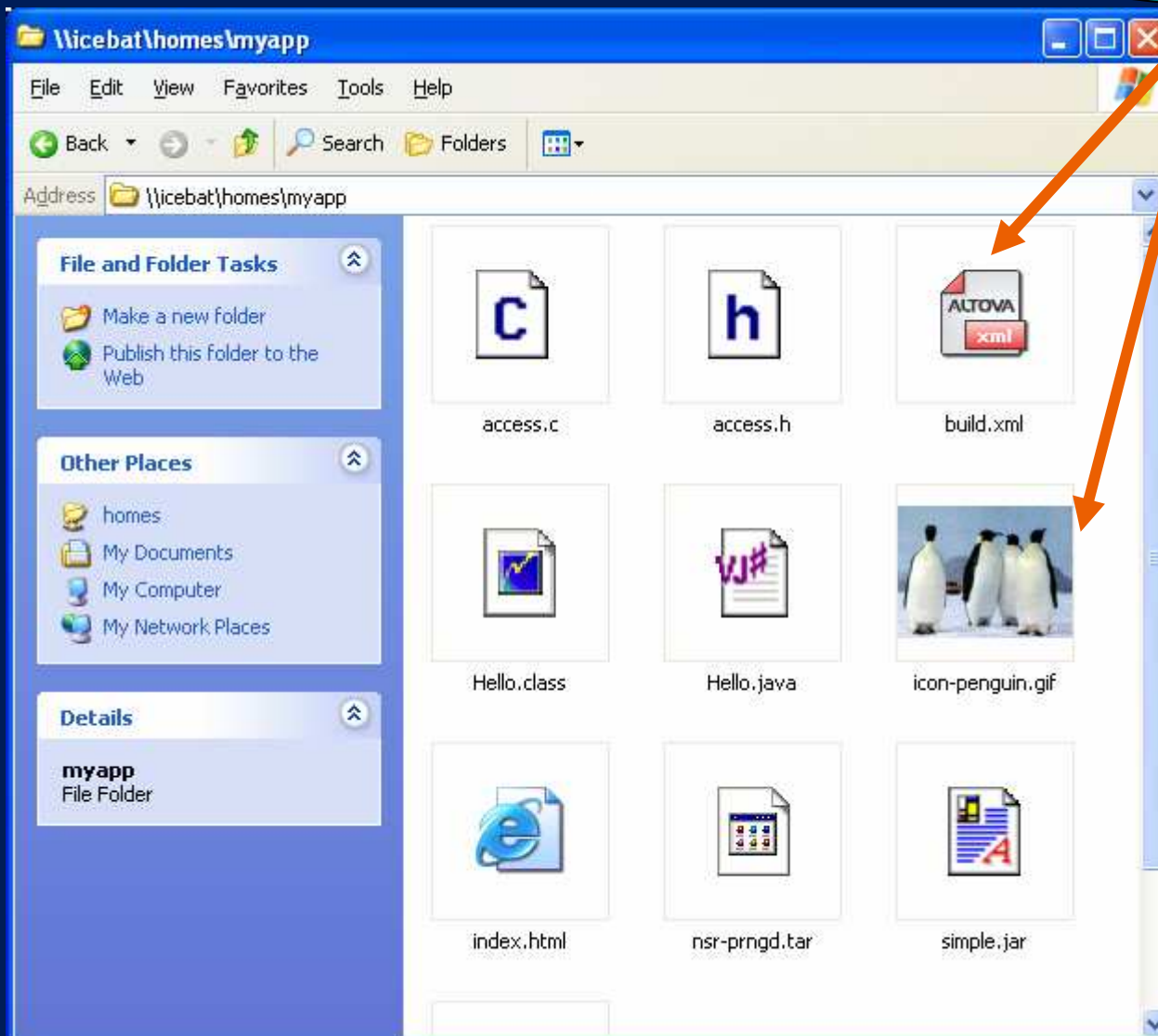
- A file/print server that can act as a member of a Windows NT 4.0 domain.
- Allows you to share your OSS files transparently to windows based platforms without any additional software needed on the PC.
- Your OSS directories and Guardian volumes appear on the PC like any other directory in the File manager.
- No client software is needed for Windows workstations, only one installation on the server side.
- Follow installation steps in README\_FLOSS
- Use OSS Sockets T8306AAY minimum (G06.14).

# Samba: Connecting from start/Run

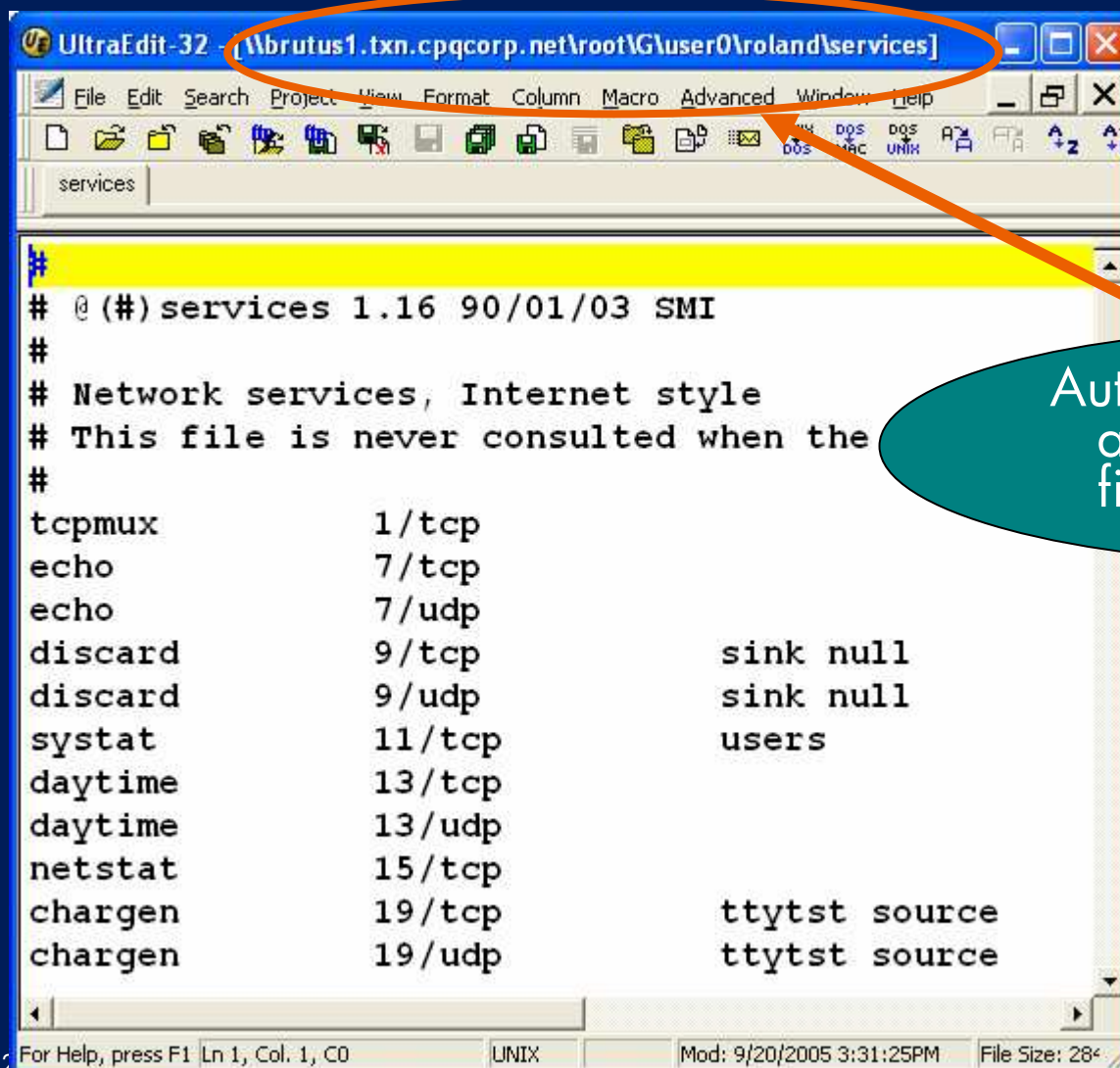


# Samba

File extensions recognized  
allow automatic  
application association.



# Samba



```

# @(#)services 1.16 90/01/03 SMI
#
# Network services, Internet style
# This file is never consulted when the
#
tcpmux          1/tcp
echo            7/tcp
echo            7/udp
discard         9/tcp          sink null
discard         9/udp          sink null
systat          11/tcp         users
daytime         13/tcp
daytime         13/udp
netstat         15/tcp
chargen         19/tcp         ttytst source
chargen         19/udp         ttytst source
  
```

Automatic edittoedit  
allows editing Guardian  
files from your PC

# Samba 3: Usage tips

- When using “Map Network Drive”:
  - Use \\<FQDN>\[share name]
  - If username/passwd matches between client and samba, no password prompting.
- Add users to Samba as SUPER.SUPER
- Drag and Drop, Outlook save as, etc.. are binary transfer. See KBNS solution gcsc903 regarding CR/LF on PCs versus unix.



# Samba 3: Troubleshooting

- Check the server is listening on the netbios ports:  
`gtac -c "scf;assume process \\\$ZB018; status " | grep -E '137|139'`
  - Check if server side nmbd responds to requests:  
`nmblookup [ -d [0-5] ] <hostname>`
  - Test your username/password on the host:  
`smbclient -L hostname -Uuser%password`  
This also lists the share names!
  - Check the logs:  
`tail -f var/log.smbd`
- Test from the Server side

- Test access from the client  
`nbtstat -A <host IP address>`
  - List the shares from the client side:  
`net view \\hostname`
- Test from the Client side

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# What is Python?

- Python is a programming language, interpreted, interactive, object oriented and highly platform-independent.
- Similar to Perl or Java but much easier to learn, less lines of codes, easier to read, no compilation step, and an interactive like shell.
- Multiple inheritance, Operator overloading, garbage collection, Exception handling,...
- Library of functions for file handling, http, Database, XML, Gui development,...
- That's significant improvements and best features of all language combination!
- One drawback, it is slower than C.

# Hello World in Python

Java

```
class Hello {  
    public static void main(String[] args){  
        System.out.println("Hello World!");  
    }  
}
```

C++

```
#include <iostream.h>  
void main()  
{  
    cout << "Hello, world." << endl;  
}
```

Python

```
print "Hello, World!"
```

Reduced amount of typing, easier to learn, rich as Java and C++, many applications available, interactive, ...

# Google search from NonStop!

ICEBAT

File Edit Settings Help

```
/home/roland/Python/Soap [2266]: cat google
#!/usr/local/bin/python
import sys,string
from SOAPpy import WSDL

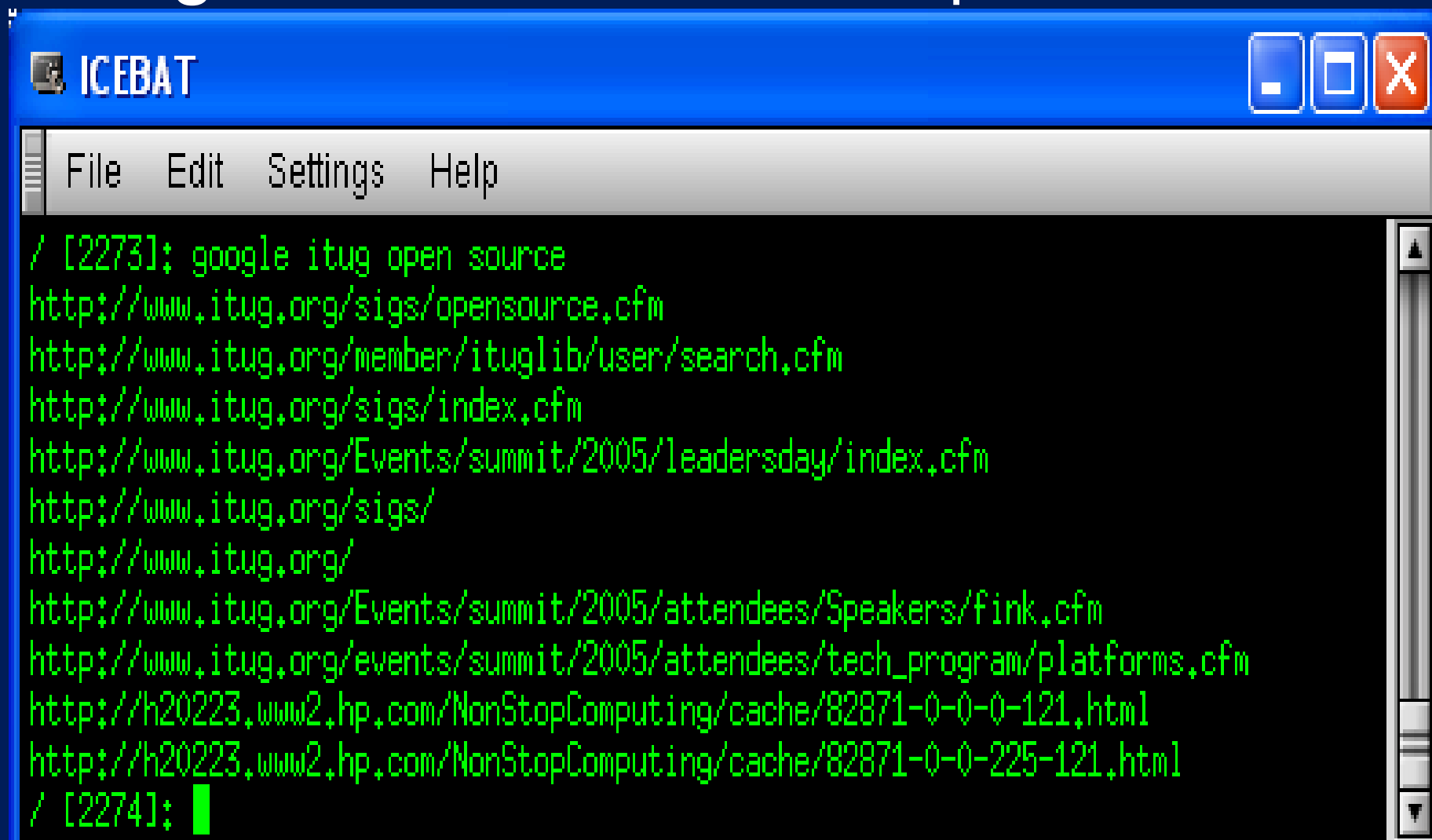
server = WSDL.Proxy('/home/roland/Python/Soap/GoogleSearch.wsdl')
server.soaproxy.http_proxy = 'proxy.sony.com:8080'
key = 'ZBHh2i0g7m1m0t0p00v110www0e2t'

searchstring = ''
i = 1
while i < len(sys.argv):
    searchstring = string.join([searchstring,sys.argv[i]], ' ')
    i = i + 1

results = server.doGoogleSearch(key,searchstring, 0, 10, False, "",False, "", "utf-8", "utf-8")
i = 0
while i<10:
    print results.resultElements[i].URL
    i=i+1
/home/roland/Python/Soap [2267]: █
```

SOAPpy automatically generates the proxy methods to access the Web service described in the WSDL file.

# Google search from NonStop!



The screenshot shows a window titled "ICEBAT" with a menu bar containing "File", "Edit", "Settings", and "Help". The main area displays a list of search results in green text on a black background. The results are as follows:

```
/ [2273]: google itug open source
http://www.itug.org/sigs/opensource.cfm
http://www.itug.org/member/ituglib/user/search.cfm
http://www.itug.org/sigs/index.cfm
http://www.itug.org/Events/summit/2005/leadersday/index.cfm
http://www.itug.org/sigs/
http://www.itug.org/
http://www.itug.org/Events/summit/2005/attendees/Speakers/fink.cfm
http://www.itug.org/events/summit/2005/attendees/tech_program/platforms.cfm
http://h20223.www2.hp.com/NonStopComputing/cache/82871-0-0-0-121.html
http://h20223.www2.hp.com/NonStopComputing/cache/82871-0-0-225-121.html
/ [2274]:
```



# Access SQL/MX from python (Windows)

## Installation

Download and install python: <http://www.python.org/>  
Download and install pyodbc: <http://pyodbc.sourceforge.net/>

## DataSource definition

- Done while installing the ODBC driver (Nonstop ODBC/MX driver) using the MS ODBC administrator. The python program below will just point to it

## Test

```
import pyodbc
db = connect("DSN=...")
c = db.cursor()
c.execute("select .... ")
rows = c.fetchall()
for row in rows:
    print row[0],row[1]
db.close()
```

# Access SQL/MX from python

```
74 sample.py - C:\Python\sample\sample.py
File Edit Format Run Options Windows Help
# sample python program using ODBC

import pyodbc

db = connect("DSN=%s;UID=%s;PWD=%s" % ("nemo", "role.dba", "Neo"))
c = db.cursor()
c.execute("select lastname, firstname from sch1.directory where lastname = 'Smith' ")
rows = c.fetchall()
for row in rows:
    print row[0],row[1]
db.close()
|
```

```
74 Python Shell
File Edit Debug Options Windows Help

Larry

Smith

P M

Smith

Paul G

Smith

Russell

>>> |
```

Ln: 45703 Col: 4



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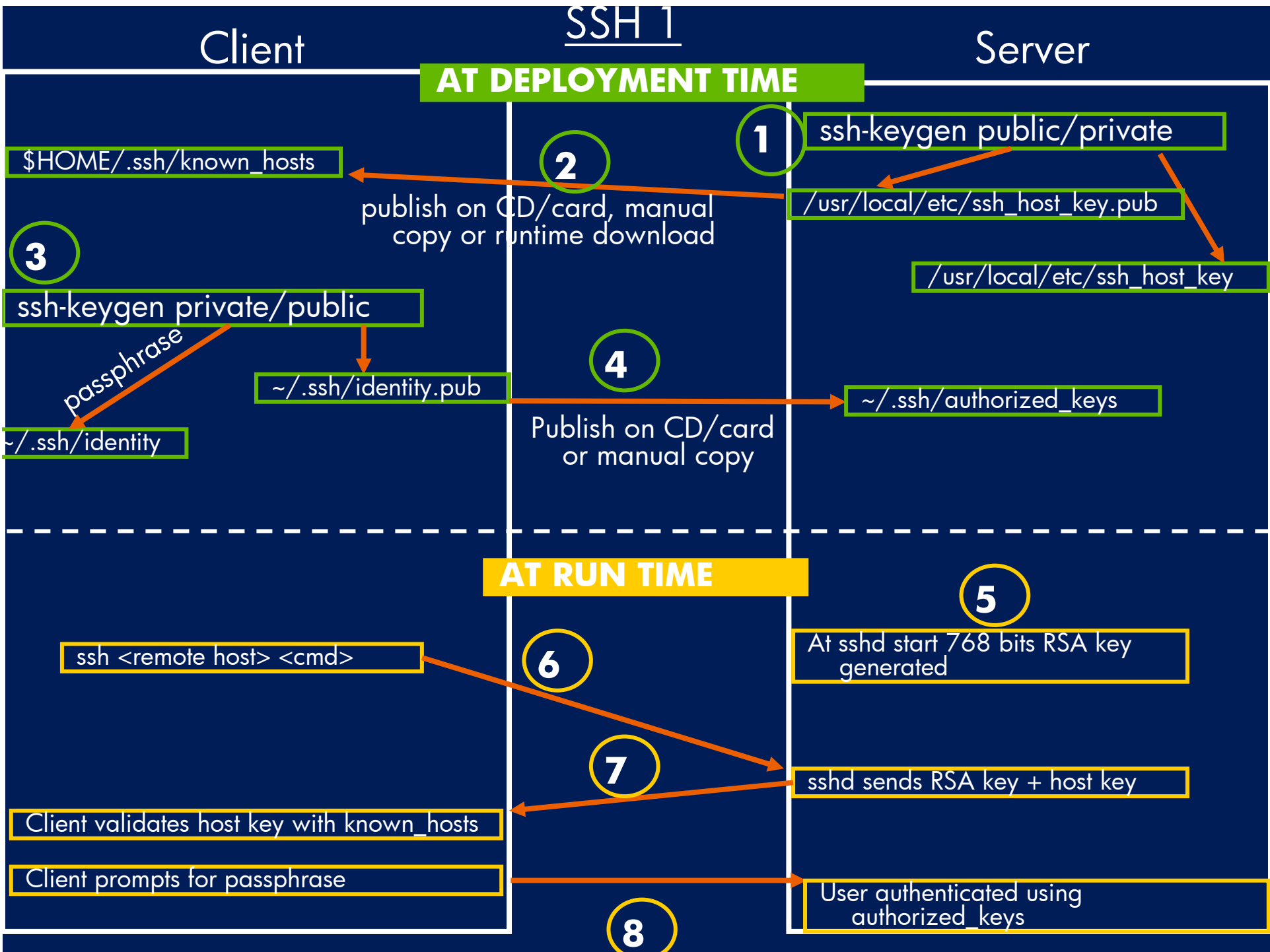


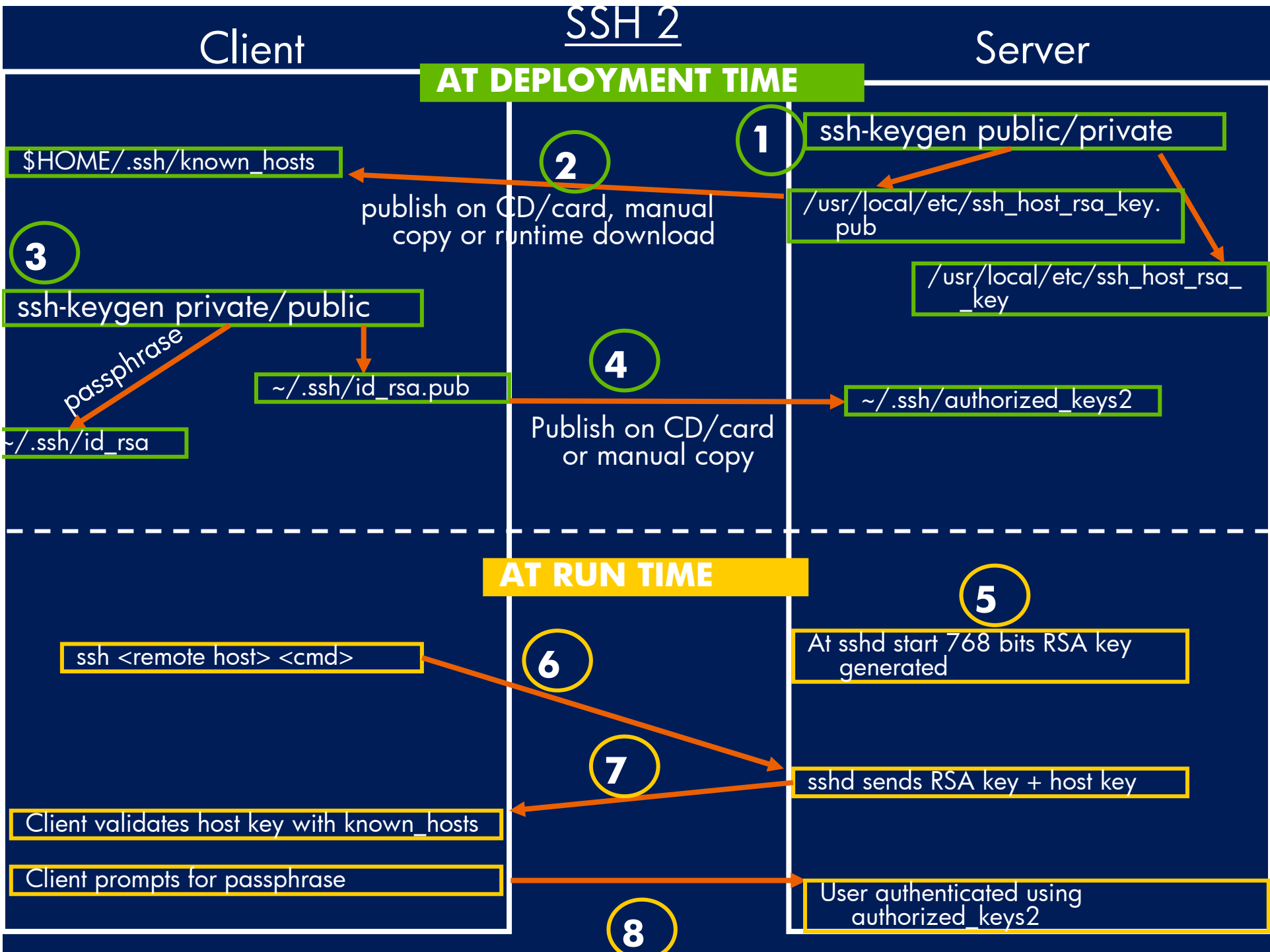
# What is Openssh?

- Openssh provides Encryption and Authentication features for login and executing commands on a remote system.
- It's main purpose is to address security issues associated with the usage of rsh, rlogin or telnet:
  - Passwords visible on the wire → **Encryption**
  - IP/DNS Spoofing → **Host authentication**
  - Password guessing → **User authentication**
- Terminology knowledge is key to implementation success!
- Those not familiar with Security are not expected to fully understand this part of the presentation but as security is reaching everywhere....

# Security and Openssh terminology

- 2 types of authentication: Host and User
- 2 protocol versions: SSH1 And SSH2
- Uses public/private key cryptography
- Both versions provide User AND Host authentication named in the following way:
  - Host authentication
    - SSH1: RSA host authentication
    - SSH2: hostbased authentication (HostbasedAuthentication)
  - User authentication
    - SSH1: RSA authentication
    - SSH2: public key authentication (PubkeyAuthentication)





# Important tips

- Telnet encryption is not available on NonStop as Pseudo-ttys are not supported on our platform.
  - Workaround: `ssh <host> sh -i` (limited capabilities).
- Regular password authentication is not available:
  - Change `PasswordAuthentication` to "no" in `/usr/local/etc/ssh_config`
- Safeguard aliases not recognized → Set an initial-directory in OSS for the Guardian user.
- Don't forget to check Secure solutions from our partners. They are many!

# Usage examples

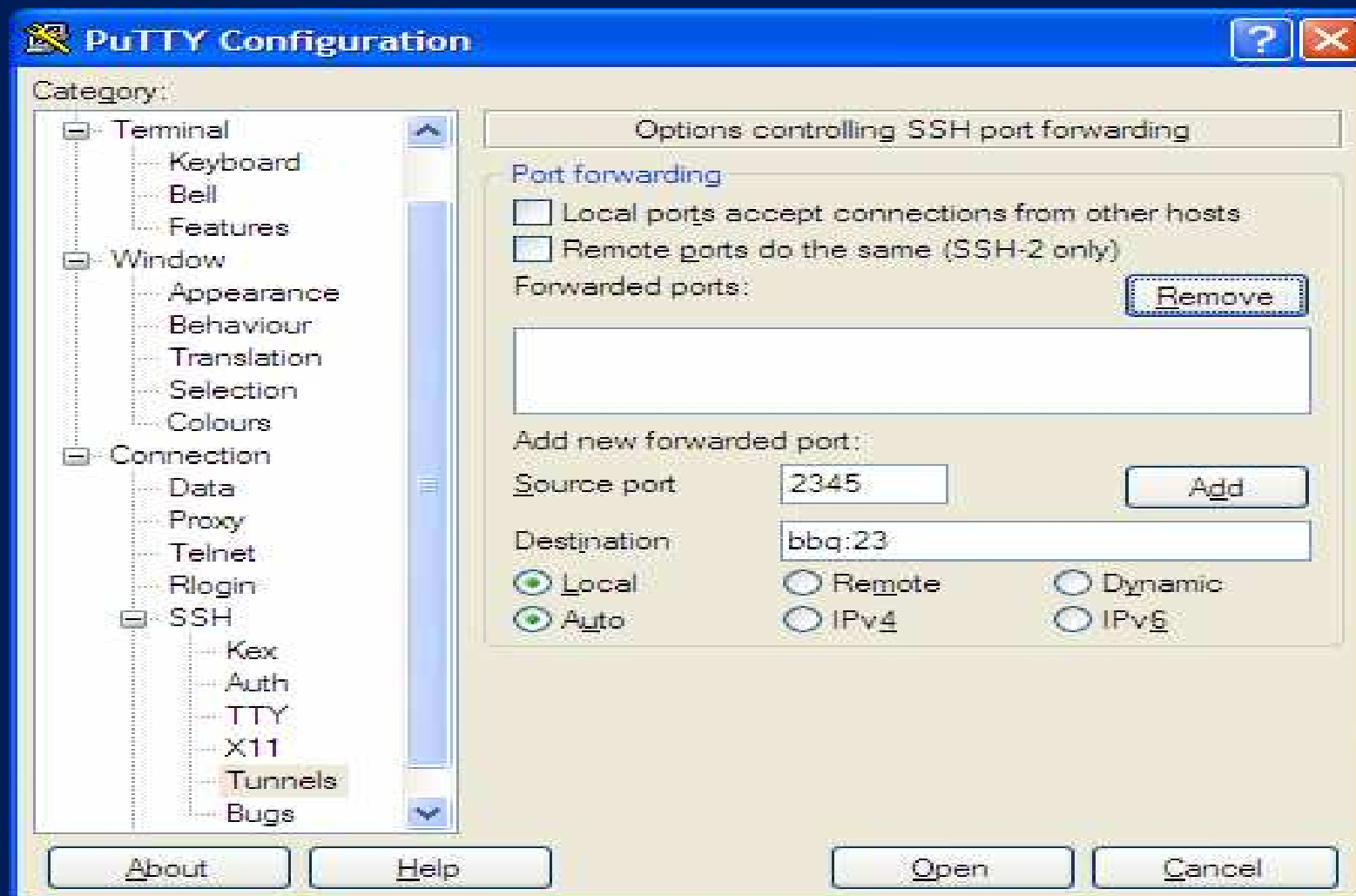
- `ssh <hostname> <cmd>` remote execution
- `scp <file1> user@host:file2` remote copy
- `sftp user@host` encrypted ftp
- `ssh <hostname> sh -l` interactive shell
- `ssh <hostname> gtacl` remote gtacl
- `sshd -d` trace on the server side
- `ssh -vvv` trace on the client side

# Tunneling

- Very easy to implement.
- No changes on the server side.
- On the client side just create the tunnel by listening on an available port and forwarding all requests from that port to the remote target service.
- Then have the application connect to that local port.
- Tip for putty: What enables RSA authentication in putty versus user/passwd is when you create a private key with puttygen and point to it in the "Auth" section.



# Tunneling with putty



# Tunneling with putty

```
C:\ C:\WINDOWS\system32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.
C:\Documents and Settings\rlemoine>telnet localhost 2345
```

```
C:\ Telnet localhost
WELCOME TO bbq.txn.cpqcorp.net [PORT $ZB018 #23 WINDOW $ZT018.#PT9BEW6]
TELSERV - T9553G06 - (30JUL2004) - (IPMADW)

Available Services:
OSS      TACL      EXIT
Enter Choice> _
```

# Summary

- It's never been easier to run Open Source on NonStop
- It's never been easier to port Open Source on NonStop
- Not only tools but complete solutions and runtime available
- Open Source software ported to S series already available on Itanium.



# Questions?



# Backup slides

# Detailed steps for Recompiling

1. download from ITUGLIB:  
awk, make, Textutils, Floss 0.6
2. Extract  
**cd /**  
**tar xovf /home/roland/floss/nsr-floss.tar**  
**tar xovf /home/roland/floss/nsr-gawk.tar**  
**tar xovf /home/roland/floss/nsr-make.tar**  
**tar xovf /home/roland/floss/nsr-textutils.tar**
3. setenv  
**export PATH=/usr/local/bin:\$PATH**  
They are many different reasons for this. Some of the Makefiles rules will not build if you use the make utility from OSS. awk delivered with OSS has limitations addressed with GNU awk. etc...
4. Install the Floss Makefile:  
**cd /usr/local/Floss/floss-0.6**  
**make install**  
This will create the /usr/local/Floss/Makefile file which can be used to make all packages you have.
5. Extract and compile an Open source:  
**cd /**  
**tar xovf /home/roland/floss/nsr-hello.tar**  
**cd /usr/local/Floss**  
**make hello**  
/usr/local/Floss [2057]: **hello**  
Hello, world!

# Recompiling pre-requisites

On a pre G06.20 system scenario, you will not be able to use Floss, GNU make and GNU awk until they are themselves recompiled.

## 1) Recompiling floss without using floss.

```
/: cd /; tar xof /home/roland/floss/nsr-floss.tar
```

```
/: cd /usr/local/Floss/floss-0.6
```

edit floss.c and comment out the following 4 functions:

getaddrinfo, getipnodebyaddr, getipnodebyname, getnameinfo

```
/usr/local/Floss/floss-0.6: PATH=/usr/local/bin:$PATH
```

```
/usr/local/Floss/floss-0.6: make
```

```
/usr/local/Floss/floss-0.6: ar -rv libfloss.a floss.o memset.o
```

```
/usr/local/Floss/floss-0.6: rm -rf /usr/local/oss
```

```
/usr/local/Floss/floss0.6: make install
```

# Recompiling pre-requisites

## 2) Recompiling GNU make without using GNU make

```
/: cd /; tar xof /home/roland/floss/nsr-make.tar  
/: rm /usr/local/bin/make  
/: cd /usr/local/Floss/make-3.79.1  
/usr/local/Floss/make-3.79.1: ../floss-0.6/conf_script_floss_cc  
/usr/local/Floss/make-3.79.1: make  
/usr/local/Floss/make-3.79.1: make install distclean
```

## 3) Recompiling GNU awk without using GNU awk

```
/: cd /; tar xof /home/roland/floss/nsr-gawk.tar  
/: rm /usr/local/bin/awk  
/: cd /usr/local/Floss  
/usr/local/Floss: make gawk
```