Information Security
Shri Vasan V S, Principal Consultant
Department of Computer Science and Engineering
Indian Institute of Technology Madras
Module #23
LINUX: Print & Sync Commands

In this module we will basically try to take a very brief look at what kind of commands are available for us to do printing and also doing some sort of thinking a between two different machines which are connected over the network so it could be either a local area network LAN network or over a wide area network over the Internet.

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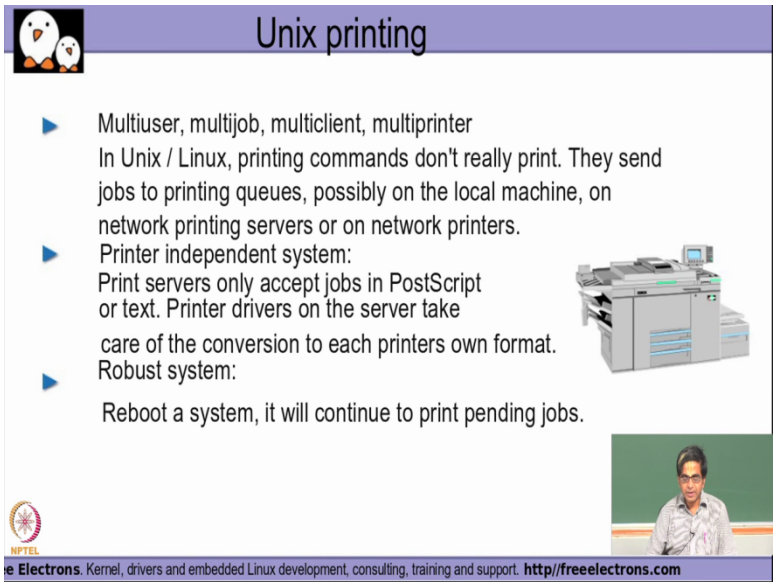

So in UNIX the printing is actually mechanism by which multiple users could actually be submitting multiple jobs from multiple machines on the network two different printers that might be available on the network so a printer could actually be connected directly to a system in which the printer would be useful only for printing from that particular system as far as Unix is concerned but here are you could also have a printer connected on the network by which all the machines in the network could also be using the same printer to fire the print job and then get there a files or data printed so as far as the Unix is concerned predominantly it is actually takes into account that the the printer machine is an independent system that is actually connected on the network and over the network we will be able to fire jobs to be printed on to the printer device.

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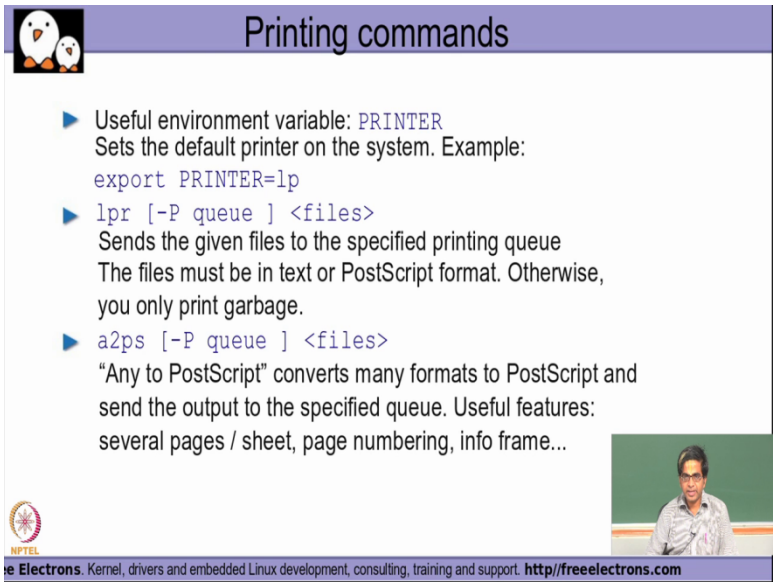

So some of the printing related commands that we need to be aware of I have a variable called environment variable called as a printer which basically says what is the default printer on the system that I want to set it to so I could actually make use of the export shell command to set the printer value appropriately.

Now after I have given this and set it I can actually use the command call lpr which will basically send the given files to a specified printing queue wherein I say lpr minus p queue if I need to be specific to the queue and then followed by whatever are the list of files that I want to be printing so this files could either be in the plain text format so any kind of a file that could be opened up to the normal text editor that we had seen in the previous module could be here or most of the printed drivers on the Linux system also accepts files to be given on the postscript format so typically files that are ending with a dot ps extension?

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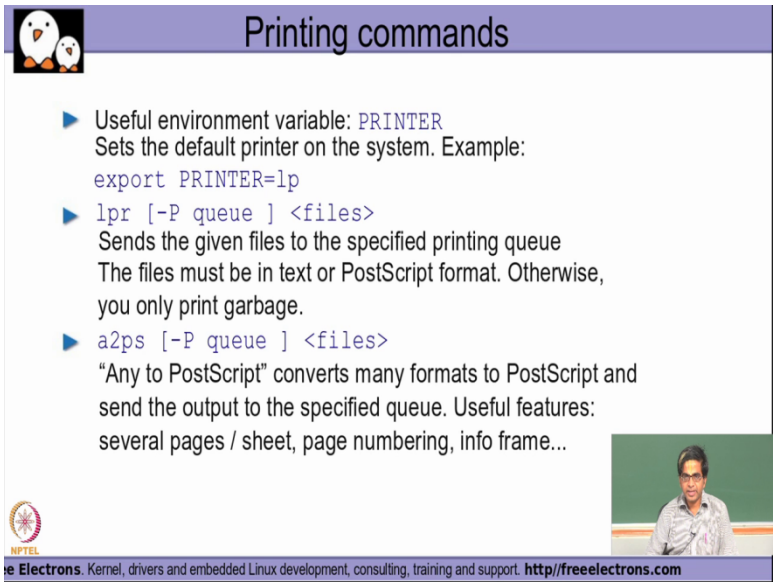

If you actually try the files in any other format or any kind of other data representation we will find that we will will get only garbage or rather non printable characters or not readable characters getting printed onto my printer right?

So sometimes it also has the potential to sort of make have a requirement that my printer driver itself needs to be a possibly restarted to make it start behaving properly after sending this kind of non supported text to the printer device so if I basically have to give any other format on some of the distributions I could also have command called a2ps which basically stands for Any to PostScript and if that particular format is capable of getting converted to a PostScript format transparently this command will try to change the format to PostScript format and then fire a printer job on the specified cube right?

So in that way there is possibility that we might be still able to get the job get the file printed out but there are only certain basic formats that are supported by this particular command even if it is actually available on your distributions so we cannot have all kinds of data formats getting converted into a PostScript format by this and then subsequently getting printed also successfully.

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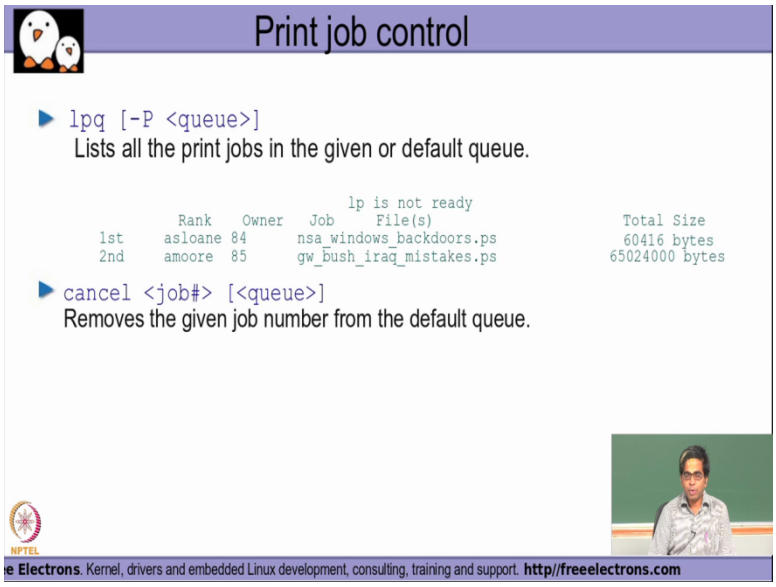

So if I want to really find out how many different jobs are there on my queue I could actually use a lpq command which will list me all the different jobs that are pending on the queue and which user has actually fired it and so on and it also tells me for example what is the total size of the bytes that needs to be printed as part of that particular job

. So looking at it if I decide that I would like to cancel a particular print job as you mean that particular job has not been already started in the printer device I could run the cancel commands to cancel the job or sort of remove the job from the queue.

So I could say cancel the job number and that particular job will be getting removed so for example in this output if you find that the second job is like sort of going to be very large size close to like around 65mb which possibly the user might have given it out by mistake and if the administrator decides that this particular job needs to be cancelled because it has been given by mistake so he can use a cancel job and then give the job number for it and then automatically this particular job will be getting deleted from my print queue.

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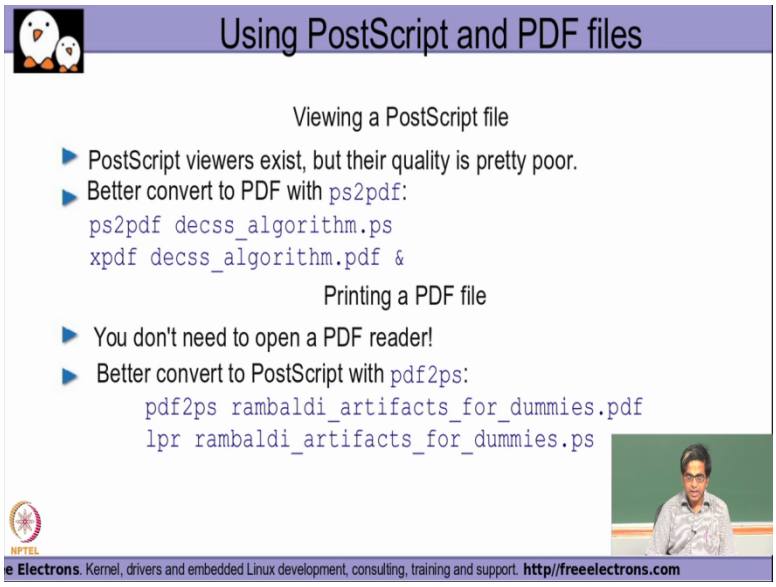

So I could also convert a PostScript file into a PDF file so that it becomes easier with a wide range of fonts that I will have the PDF format. So I could use a ps to PDF command to convert a PostScript file to PDF file open up the PDF file with any kind of a PDF editor like an xPDF or (())(05:55) depending on the particular application that has been installed PDF application that has been installed on the system and then from that particular PDF application I could also fire the print job so that I will be able to get the print out in a much more neat format with lot of fonts that are actually available in the PDF form.

So if I don't have a PDF form PDF application, PDF reader application I also have an option by trying to convert that PDF file into a PostScript file by using the command called PDF2 ps and then firing that PostScript file into by printer queue for getting in printed so either way we have options to basically have the content printed out .

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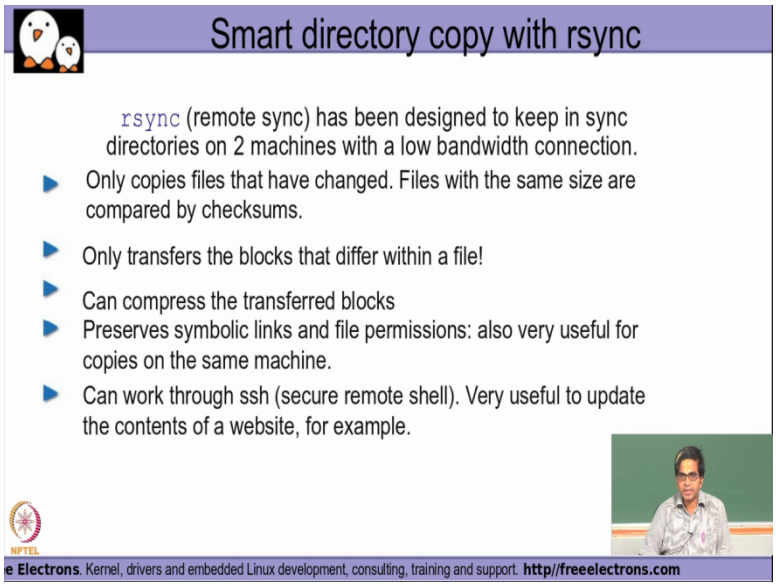

So now coming into the next command for syncing a file across a system across the network into another system which is actually connected either in my local area network there is a lAN or over the Internet there is a very powerful command called as rsync the rsync stands for remote sync so what this actually tries to do is it tries to sort of sync up two directories on two different machines which are typically connected over a very low band width connection.

Now what this actually does is basically try to do a complete copy of one directory so typically in practical environment what really happens is when I have a directory which is having let's say lot of contents in it running into maybe like mbs or gbs of data which I have a requirement to keep updating so some part of my directory is going to be getting updated but I have requirement to be very safe and I have a requirement that I need to have a copy of this entire directory available on another machine right?

which is actually connected maybe let's say remotely over the internet and my band with connectivity that I have between these two machines is very low so in this kind of scenario I have a requirement that has been put forward to me that the directory contains in the local machines should be getting continuously updated on to the remote machine and I have a very low band with connection between the two machines right?

Now that is basically where a very powerful syncing utility like rsync comes in reflect now what is this rysnc actually does is so we said I could be able to copy the directory contents

from one machine to another machine and because a directory in a typical scenario where I am employing rsync to be used will contain lots of files.

Rsync has internally got the capability to identify what files have got changed and only copy those files across to the remote system and that too it will not copy the entire file content but will only transfer the blocks that differs within a particular file on the local system and the remote system

So it has a mechanism by which it will be able to detect first which files have got changed number 1 , number 2 among the changed files identify what are the data blocks that have actually got modified and only transfer those data blocks across the remote system and it also has one more advanced feature where that data is also compressed and the compressed portion of the data is what is actually sent over the connectivity to the remote system.

Now we were just discussing that typically this command will be very useful when we really have a very low band width connection now you will be able to understand better why we were telling specifically about the low band with connection because when I have a low band with connection I need to basically optimise on how much of data that I am really trying to transfer over that connection for me to effectively make use of it. So when I have a utility that is not blindly going to transfer the entire directory contents across to the remote system every time I want to sync right?

Which would essentially mean that I am going to be occupying the entire band width and because it is very low band width I am also going to be ending up spending a lot of time for this whole transfer to complete.

What we are end up doing with sync is that is going to modify is going to transfer only the modified files within the modified files it is going to only transfer the data blocks that has been changed as compared to the previous transfer that was done on to the remote system and again one more advanced feature more than this feature is even those data blocks I will be able to compress

So that effectively as we had seen in the previous module when I compress my size is going to become drastically lesser because the size is becoming drastically lesser I am going to take that much extremely less amount of band width on my net connectivity to be sending it across to the remote system right?

So this is something that will be very very handy when i have a requirement that I want to have one huge let's say directory repository on my local system to be backed up on to a remote system which is actually have a connectivity with a local system in a very very low band width capacity right? So this is something which could be typically used with the secure shell which will have an added advantage to the data when it is actually going even the compress data that is actually going over the network will be protected by sort of encrypting the data at a time of transmission and decrypting the data at time of receiver by the remote system right?

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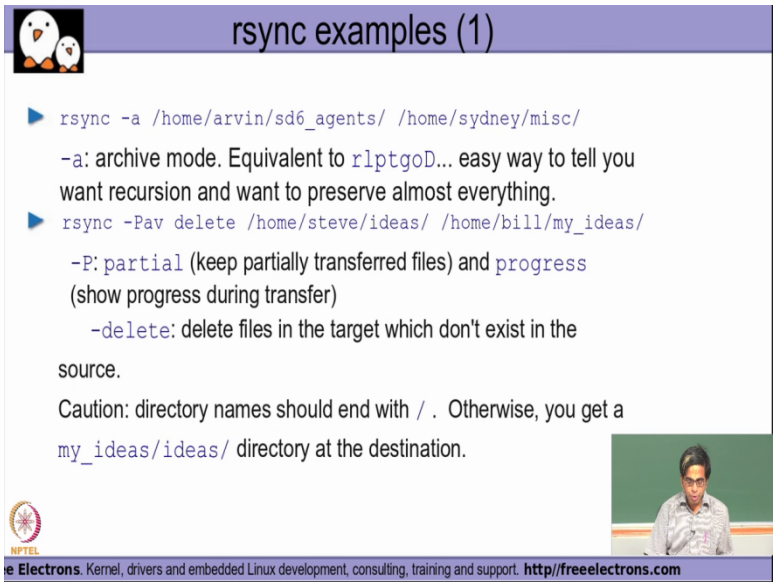

So how do I actually make use of it I specify sync-a I specify first what is the location that I want to take the source data for packing it up and destination location I specify but in this particular case both the source of the destination has actually been given as a same mission but in a typical scenario you will find the destination mission is a different mission and we will see an example in the next slide so when we say archive mode we basically say that we want to take an archive of the entire source and then sort of sync it up to the destination location

So when we say Pave and then also use a delete when we say Pav if for example I have been able to transfer only part of the file and as part of the transferring this file i had a down time on the network link i will basically keep the partially transferred files for me to restart the transfer from wherever I had left once a network link comes back up again so these are some options that i could actually make use of with the sync command to make it more powerful

now if I use the minus delete option also in the command line this will also enable so this will also delete the files in the target which is not actually existing in the source mission right

Now so when will this scenario come in when i have taken a backup of the directory today for example in which my directory contain 10 files so all these 10 files would be actually getting backed up on the remote system or on the remote location tomorrow if out of this 10 files 2 files have been removed in my source system minus delete option if i use the sync command and i run the sync command today what it will really do is these two files that have been deleted in the source today will also be getting deleted in the target location so if i don't use this minus delete option the deletion of the files is the target to make it completely in synchronisation with the source will not be done.

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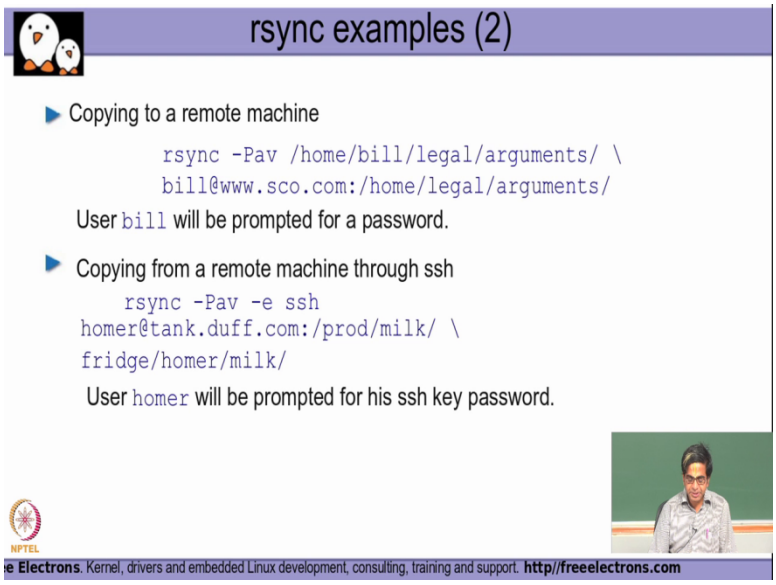

So if i have to copy it to a remote mission what we actually do is we specify the source location here and then specify what is a remote mission location so if you find here it has been given as bill at one particular domain name now what does this actually mean is that bill is the user on this particular system: followed by the location

So what we are actually trying to convey is this is the source location on my local system from which i am trying to run the rsync command i want to take the contents of this particular directory whatever is there currently and copied into a remote location now what is the remote mission the remote mission is www.sco.com on the remote mission where should i copy i should copy it as bill user,

User bill i did not expected that the user bill is a valid bill user on that particular system as user bill what is the location in which the rsync has to copy it has to copy into this particular location so whatever are the contents of this source location slash home slash bill slash legal slash arguments will now be copied into the location slash home slash legal slash arguments on this particular mission remote mission www.sco.com as user bill right?

Now when this command is run because this local user is trying to copy as user bill the rsync command will prompt for the bills password to be typed on the remote system so only after the password for a user bill on this remote system is typed the rsync command will actually go ahead with the copy so if by chance the user is typing a wrong password for the user bill then rsync command will basically fail saying that authentication has not been successful right?

On the other hand if I want try to do with ssh as we were discussing in the previous slide so ssh is basically a mechanism by which the data transfer will happen in a very secure manner where the data will be sort of getting encrypted before it has actually put on to the network and on the receiver system on the remote system as soon as it is retrieved the data will be decrypted before it is actually stored on to the destination location.

So if I have really wanted to be very secure rsync also has a mechanism by which I can say that I want this data transfer to be made whenever it is done over a secure mechanism by using this particular option of e.

Thank you!