Using HPCFS

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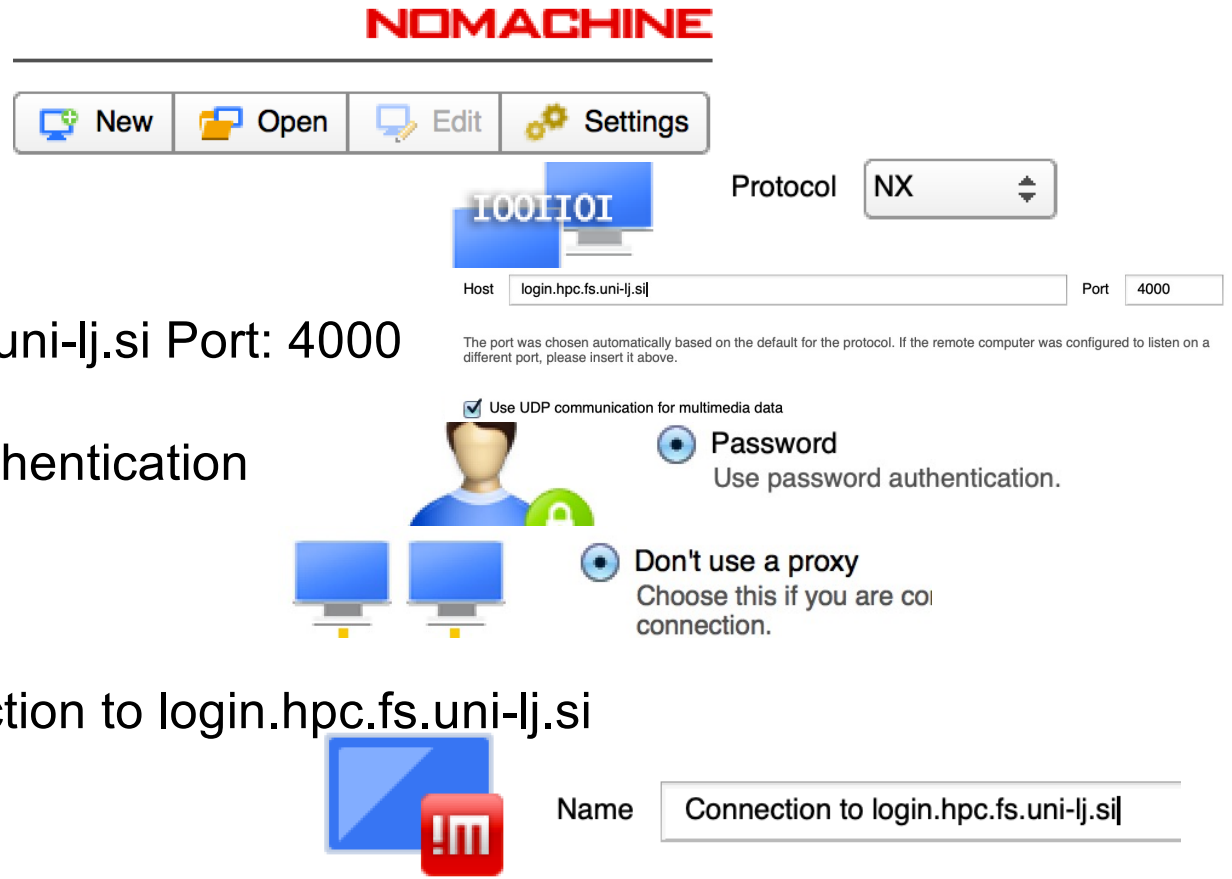
Setting up the NoMachine client

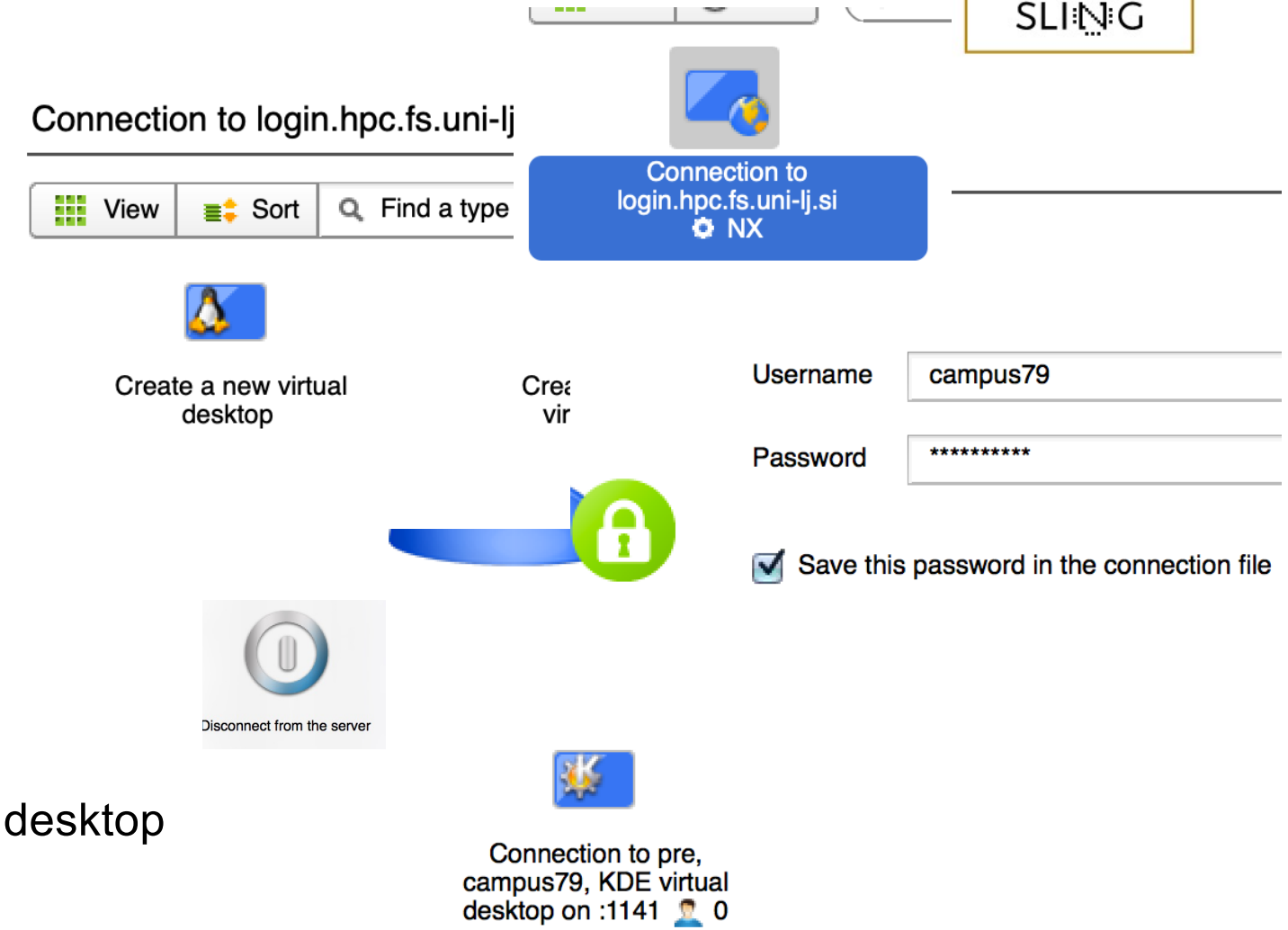
Available for installation at page https://www.nomachine.com/download-enterprise#NoMachine-Enterprise-Client

1. Select New
2. Protocol NX
3. Host: login.hpc.fs.uni-lj.si Port: 4000
4. Use Password authentication
5. Don’t use proxy
6. Done with Connection to login.hpc.fs.uni-lj.si

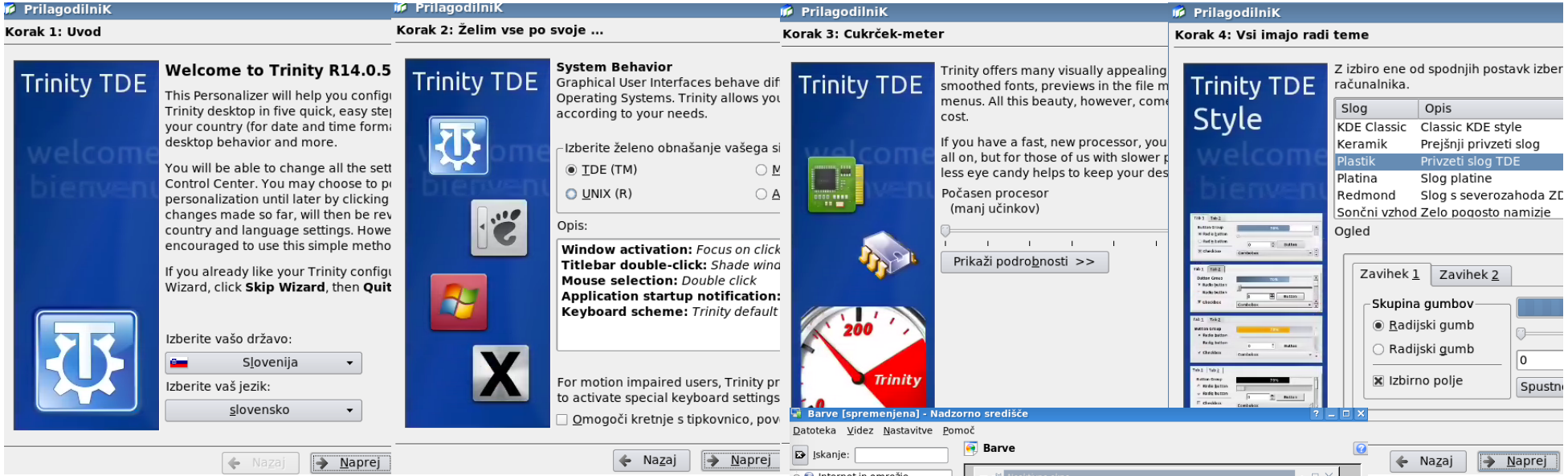


Connecting to HPCFS

1. Select and Connect
2. Use your account credentials
3. Create New desktop once
4. Use the Trinity (KDE) desktop
5. To Disconnect press Ctrl+Alt+T
6. To Reconnect select previous virtual desktop



Tuning desktop with KPersonalizer for remote speed (use less effects=slower processor)



Use Trinity Control Center to setup colors for Non TDE programs: Uncheck “Enforce colors for Non-TDE programs”

Basic HPCFS cluster usage

- Setting GNOME or KDE desktop locale preferences for keyboard, LANG environment
- Using NX client (Disconnect, Terminate, Logout)
- Console commands in Linux
- Editors for programming (emacs, gedit, kate, eclipse, vi, pico, ...) on login only!

Modules (LUA)
- module avail
- module help/info
- module show
- module load/unload
- module list
- module purge

SLURM batch scheduler

Compiled-in OpenMPI support
- `srun --nodes=N --ntasks=n cmd`
- `sbatch script.sh`
- `sinfo`
- `squeue`
- Alias for interactive usage of nodes:

```
alias node='srun -N1 --time=1:00:00 --pty bash -i'
```

Using SLURM (interactivelly) and Message Passing Interface (MPI)


```
[leon@viz mpi]$ module purge && module load foss/2019a
[leon@viz mpi]$ cat hello.f90
program hello
   use mpi
   integer rank, size, ierror, strlen, status(MPI_STATUS_SIZE)
   character(len=MPI_MAX_PROCESSOR_NAME) :: hostname


   call MPI_INIT(ierror)
   call MPI_COMM_SIZE(MPI_COMM_WORLD, size, ierror)
   call MPI_COMM_RANK(MPI_COMM_WORLD, rank, ierror)
   call MPI_GET_PROCESSOR_NAME( hostname, strlen, ierror )
   print*, trim(hostname), rank, size
   call MPI_FINALIZE(ierror)
end
[leon@viz mpi]$ mpif90 hello.f90
[leon@viz mpi]$ LD_PRELOAD= srun -n 4 --tasks-per-node=2 --kill-on-bad-
exit --partition=haswell ./a.out
 cn80           2           4
 cn79           0           4
 cn80           3           4
 cn79           1           4
```

OpenMP

```
#include <stdio.h>
#include <math.h>
#define N 1000000
int main()
{
  double area = 0.0;
  #pragma omp parallel for reduction(+:area)
  for(int i = 0; i < N; i++)
    {
      double x = (i+0.5)/N;
      area += sqrt(1.0 - x*x);
    }
  printf("Pi : %14lf\n", 4.0*area/N);
  return 0;
}
[leon@cn36 pi]$ module purge && module load foss/2019a
[leon@cn36 pi]$ gcc -fopenmp pi-openmp.c  -lm -o pi-openmp
[leon@cn36 pi]$ OMP_NUM_THREADS=4 ./pi-openmp
```

http://hpc.fs.uni-lj.si

Thanks!

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