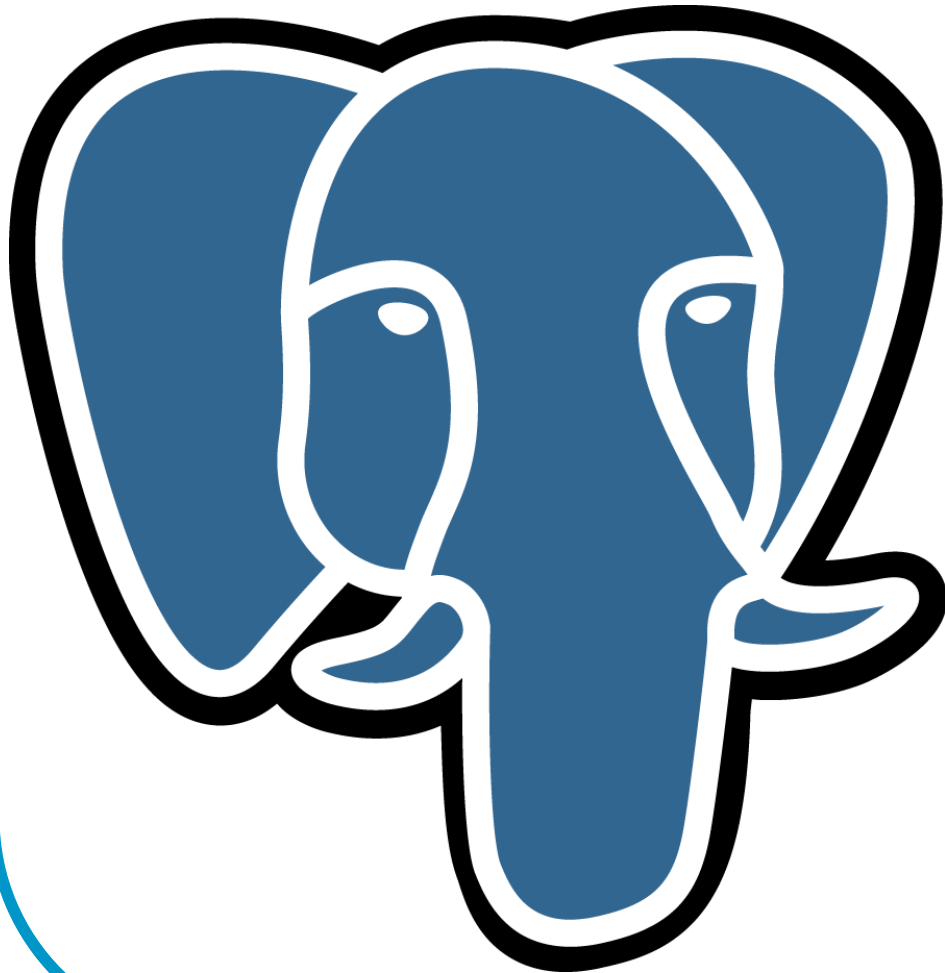


PostgreSQL on Windows



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Agenda

- Why PostgreSQL on Windows
- PostgreSQL for the Windows user
- Windows for the PostgreSQL user

Why PostgreSQL on Windows

- Isn't Linux better?
 - Often, but not always
- Several scenarios
 - Developer laptops
 - Desktop database
 - Migration scenarios
 - Corporate policies

Agenda

- Why PostgreSQL on Windows
- **PostgreSQL for the Windows user**
- Windows for the PostgreSQL user

PostgreSQL for the Windows user

- Unix inheritance
 - Multi-process, not multi-thread
 - Shared memory
 - Requires "modern" windows (2000+, no FAT)
- Commandline!
 - psql, pg_dump, pg_dumpall, etc
 - pgAdmin3 to the rescue!

PostgreSQL for the Windows user

- Environment variables
- Configuration files
 - No registry
 - Edit with any text editor (e.g. notepad)
 - Edit with pgAdmin3
 - Still just a textfile
 - Signal server to reload (pause service)
- Security
 - Will *not* run with administrative privileges

Agenda

- Why PostgreSQL on Windows
- PostgreSQL for the Windows user
- **Windows for the PostgreSQL user**

Windows for the PostgreSQL user

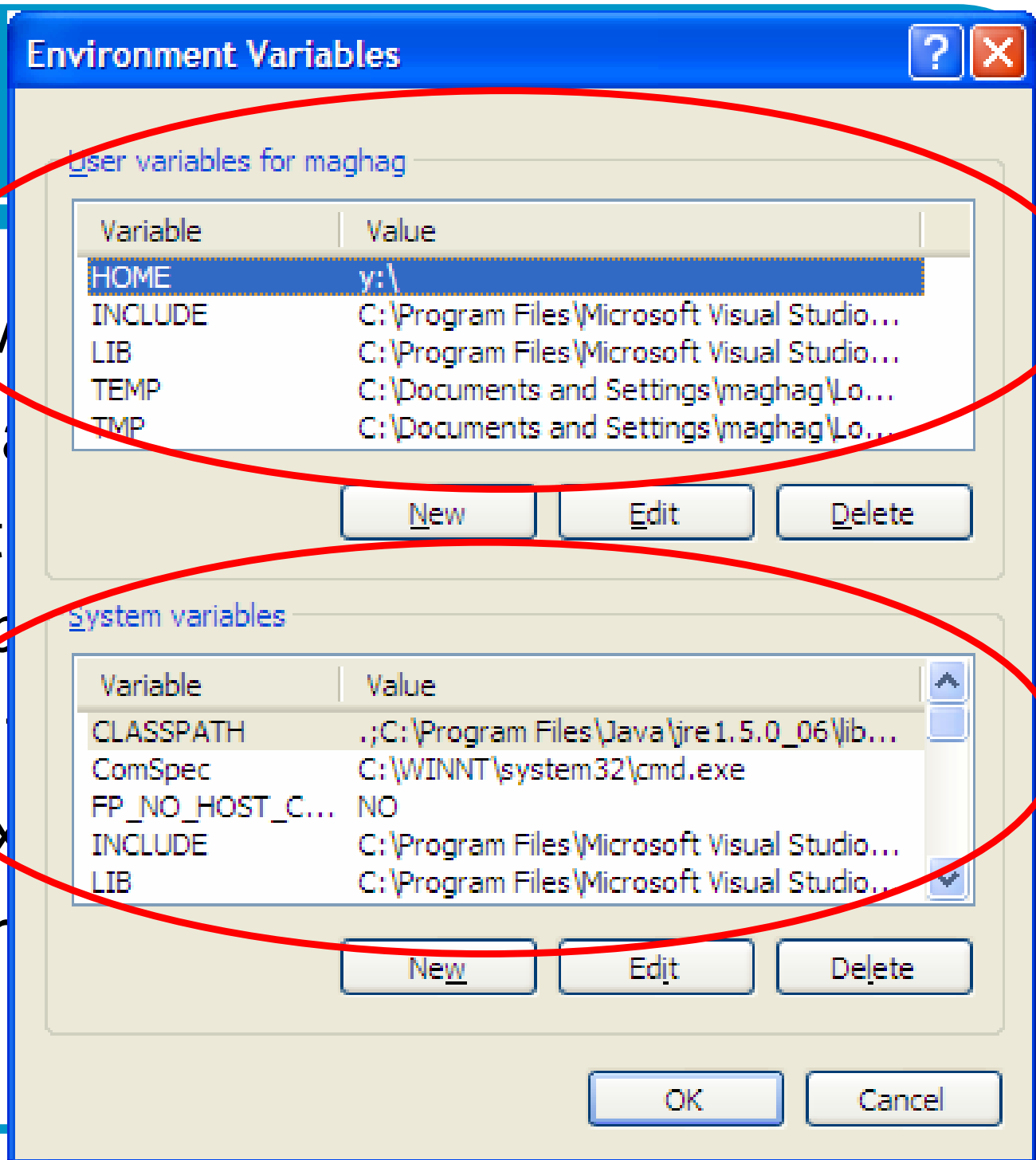
- It's a brave new world
- None of the normal tools
 - No ps
 - No kill
 - No top
 - No cron
- Builtin Windows tools are generally bad

Architectural differences

- Runs as a service
 - Windows version of daemon
 - Started by "Service Control Manager"
 - Has it's own login
- Logs to a file or eventlog
 - Startup errors *always* to eventlog
- CreateProcess() instead of fork()
 - Extra important to use connection pooling

Installing

- Use the M...
- External l
 - Perl, pyt
 - Path is p
- Or install
 - Complex
- Multiple in



Configuration parameters

- shared memory
 - Workload dependant
 - Smaller is better?
- fsync methods
 - open_datasync
 - fsync_writethrough
- log_destination
- lc_xyz

Managing PostgreSQL

- Get the right tools!

[http://www.microsoft.com/
technet/sysinternals](http://www.microsoft.com/technet/sysinternals)

- Process Explorer (*the* tool for Win32)
- pstools
- Process monitor (debugging)
- Junction (tablespaces, xlog location)

Where did it go – ps title?

- Unix:

```
root@svr1:~# ps axuwf |grep postgres
pgsql      1397  0.0  0.1  5360 1744 ?        S      2006   0:23  \_ postgres: logger process
pgsql      1399  0.0  0.3 15708 4160 ?        S      2006   2:29  \_ postgres: writer process
pgsql      1400  0.0  0.1   6360 1808 ?        S      2006   0:03  \_ postgres: stats buffer process
```

Where did it go – ps title?

- Win32:

The screenshot shows the Process Explorer window from Sysinternals. The main pane displays a list of processes, with a red oval highlighting the PostgreSQL-related entries:

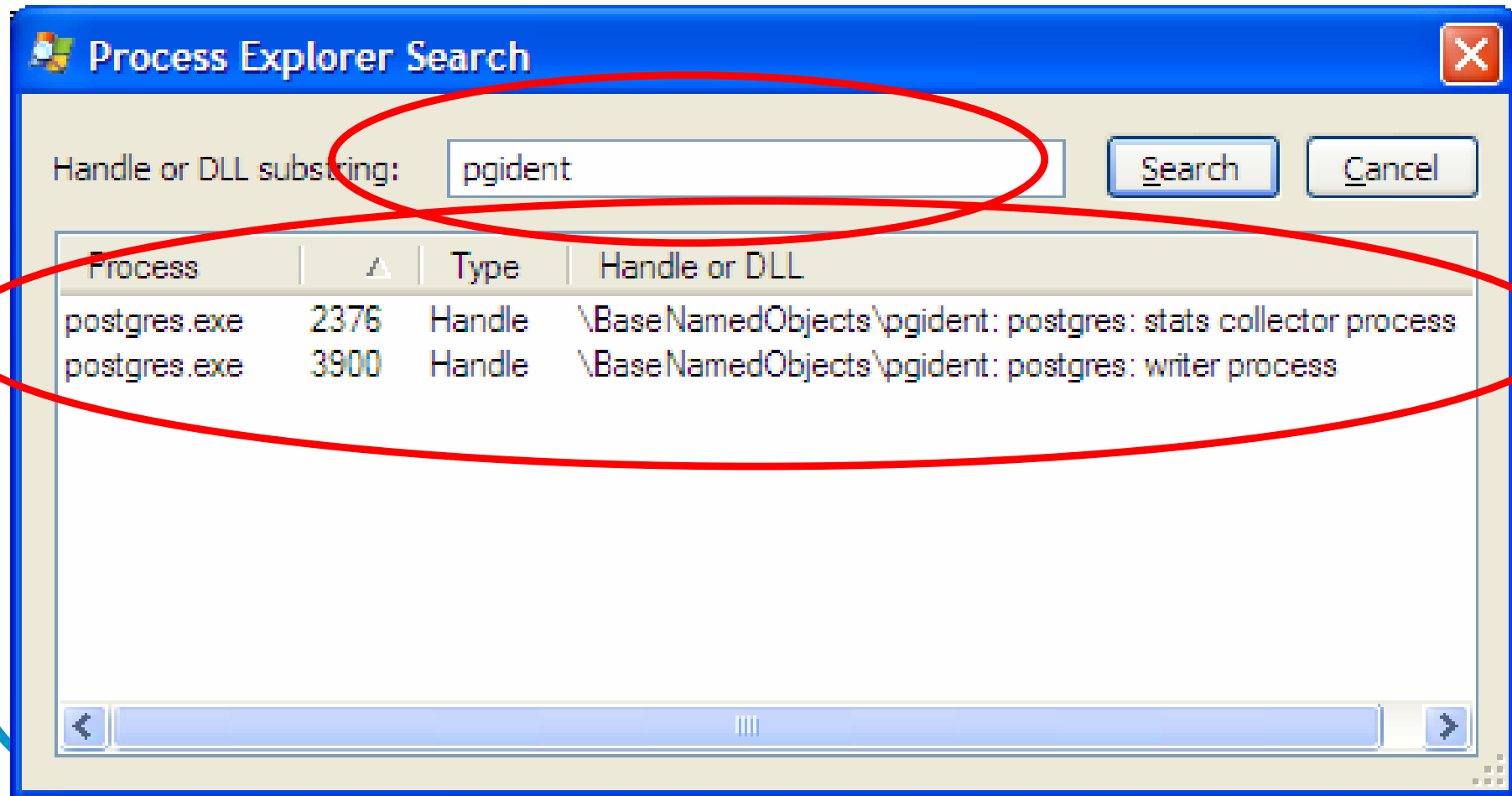
Process	PID	CPU	Description	Company Name
pg_ctl.exe	3648		pg_ctl - starts/stops/restarts t...	PostgreSQL Global Development Group
postgres.exe	4292		PostgreSQL Server	PostgreSQL Global Development Group
postgres.exe	3948		PostgreSQL Server	PostgreSQL Global Development Group
postgres.exe	260		PostgreSQL Server	PostgreSQL Global Development Group

The bottom pane shows the handles for the selected process, with a red oval highlighting the following entry:

Type	Name
Directory	\KnownDlls
Event	\BaseNamedObjects\pgident: postgres: writer process
File	\Device\Udp
File	C:\prog\pgsql\mvs\data
File	C:\WINNT\WinSxS\x86_Microsoft.Windows.Common-Controls_6595b64144ccf1df_6.0...

Where did it go – ps title?

- Win32:



Where did it go – strace

- Unix:

```
svr1.hagander.net - PuTTY
```

```
root@svr1:~# strace -p 12771  
Process 12771 attached - interrupt to quit  
recv(7, █
```


Where did it go – strace

- Win32:

postgres.exe:4404 Properties

TCP/IP Security Environment Job Strings
Image Performance Performance Graph Threads

CPU CSwitch Delta Start Address

- postgres.exe!mainCRTStartup
- postgres.exe!pg_signal_thread
- postgres.exe!pg_timer_thread

Stack for thread 5164

- 0 ntkmipa.exe!KiUnexpectedInterrupt+0xf0
- 1 ntkmipa.exe!NtWaitForSingleObject+0x38c
- 2 ntkmipa.exe!KeReleaseInStackQueuedSpinLockFromDpcLevel+0xb
- 3 ntdll.dll!KeFastSystemCallRet
- 4 postgres.exe!pgwin32_waitforsinglesocket+0x1cf
- 5 postgres.exe!pgwin32_recv+0x83
- 6 postgres.exe!secure_read+0x20d
- 7 postgres.exe!pg_recvbuf+0x97
- 8 postgres.exe!pg_getbyte+0x16
- 9 postgres.exe!SocketBackend+0xb

Copy OK Stack

Dynamic Priority: 8

Monitoring PostgreSQL

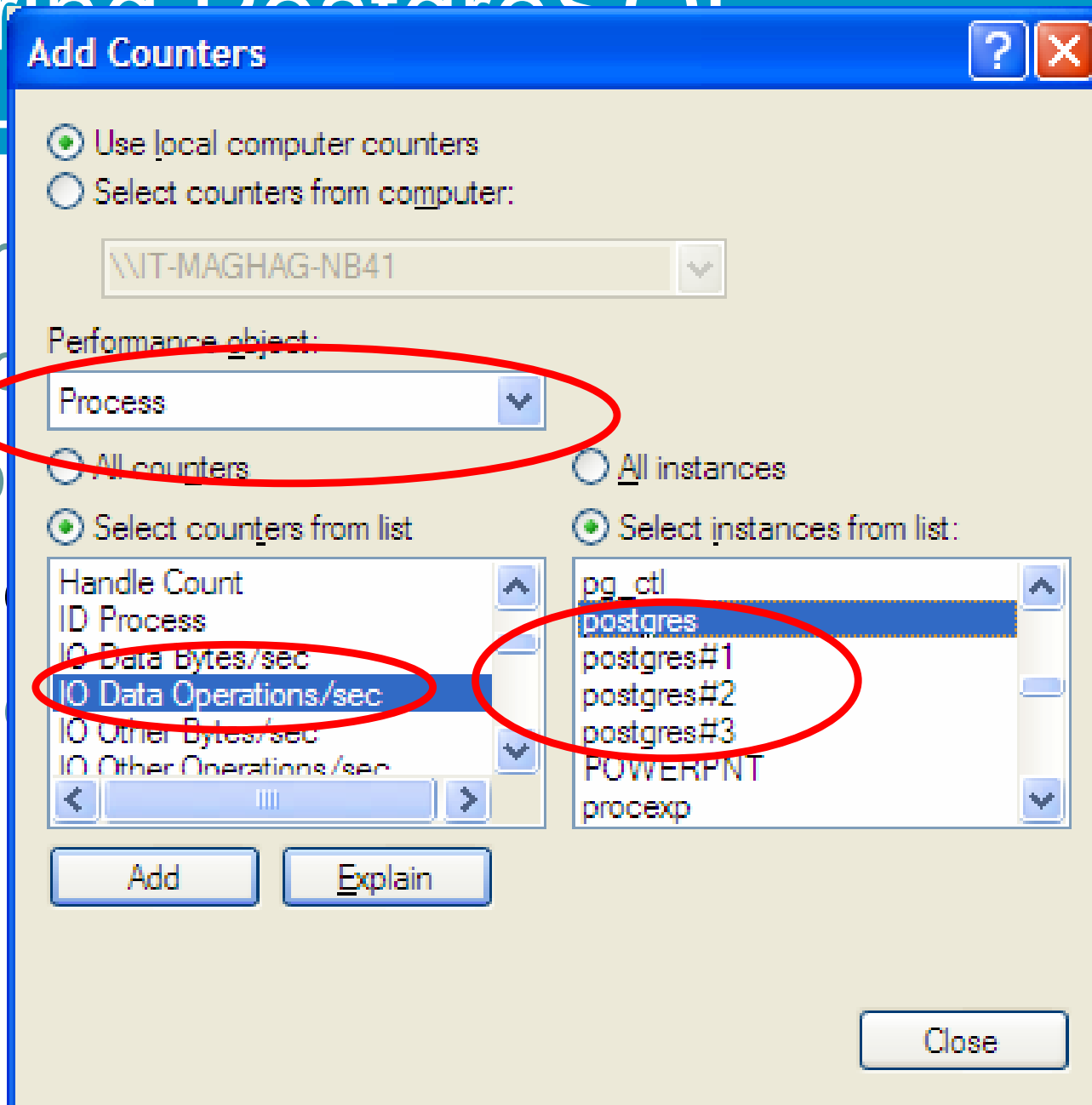
- Some things really didn't change
- pg_stat_xyz
 - *Has not changed at all*
- PostgreSQL logs
 - pg_data*.log
 - Don't forget eventlog!

Monitoring PostgreSQL

- Performance Monitor
 - Standard Windows monitoring still applies!
- Monitoring the whole server
- Looking at individual backends
- Looking at the whole cluster

Monitoring PostgreSQL

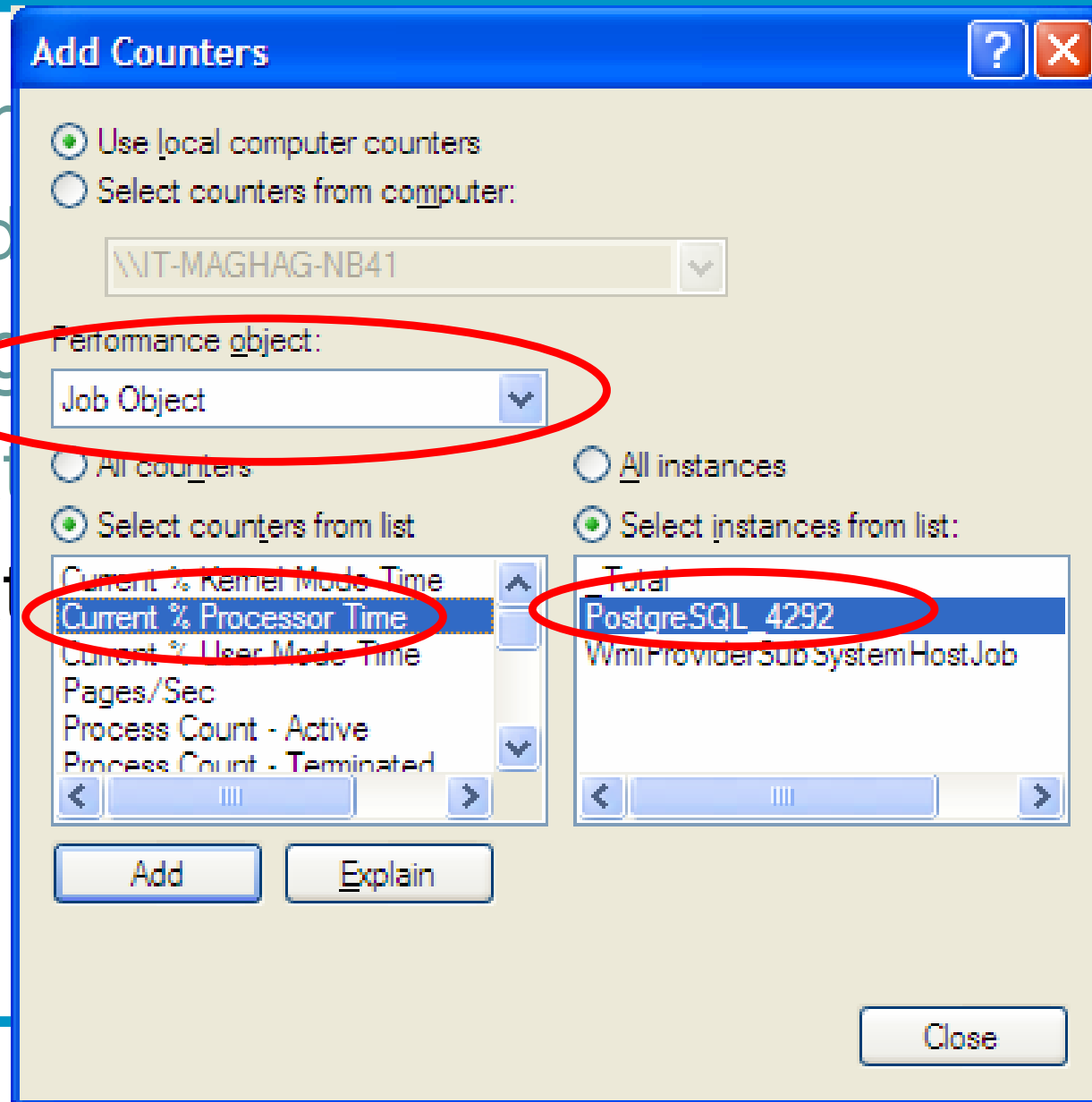
- Performance
- Standby
- Monitoring
- Looking at
- Looking at



s!

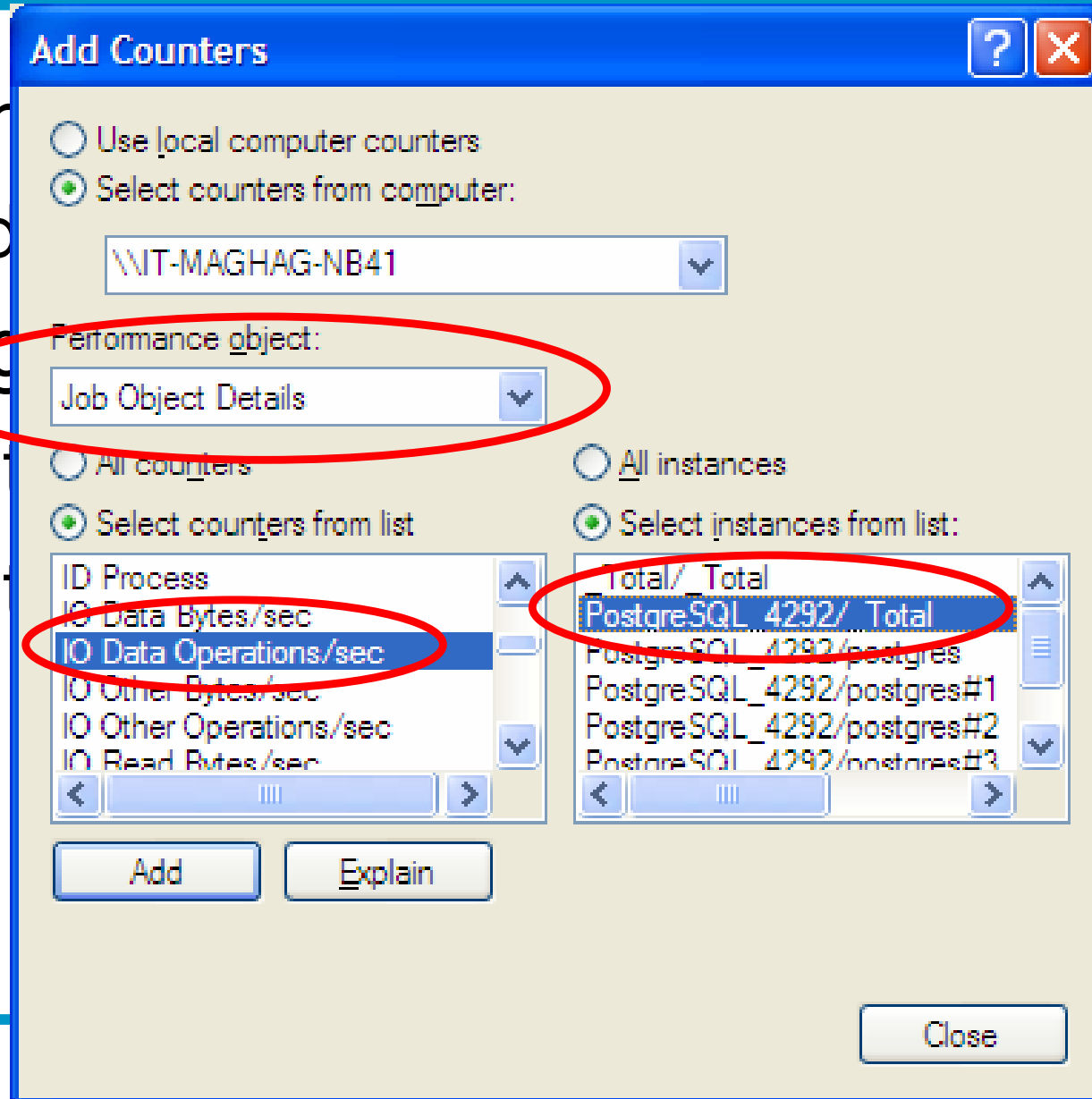
Monitoring PostgreSQL

- Performance
 - Standard
- Monitoring
- Looking at
- Looking at



Monitoring PostgreSQL

- Performance
 - Standard
- Monitoring
- Looking at
- Looking at



Interesting counters to watch

- Number of processes
- New process creations
- Pages/second
- Memory usage (private bytes, working set)
- I/O operations / second
- I/O bytes / second
- Physical disk queue length

Monitoring with Process Explorer

- Add extra columns
 - Private bytes
 - Local backend memory
 - WS Shareable / WS Shared
 - Shared buffer + shared code
 - Virtual Size
 - Just address space
 - Context switch delta
 - Expensive on Windows!

Thank you!

Questions?