SECTION – 3
DB2 ARCHITECTURE

Lecture 5

DB2 Process Model

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Understanding Processes & Threads

- A process is an executing instance of an application. It can contain multiple threads. A thread could be considered as a light-weight version of a process

- Thus, the essential difference between a thread and a process is the work that each one is used to accomplish. **Threads are used for small tasks, whereas processes are used for more 'heavyweight' tasks** – basically the execution of applications.

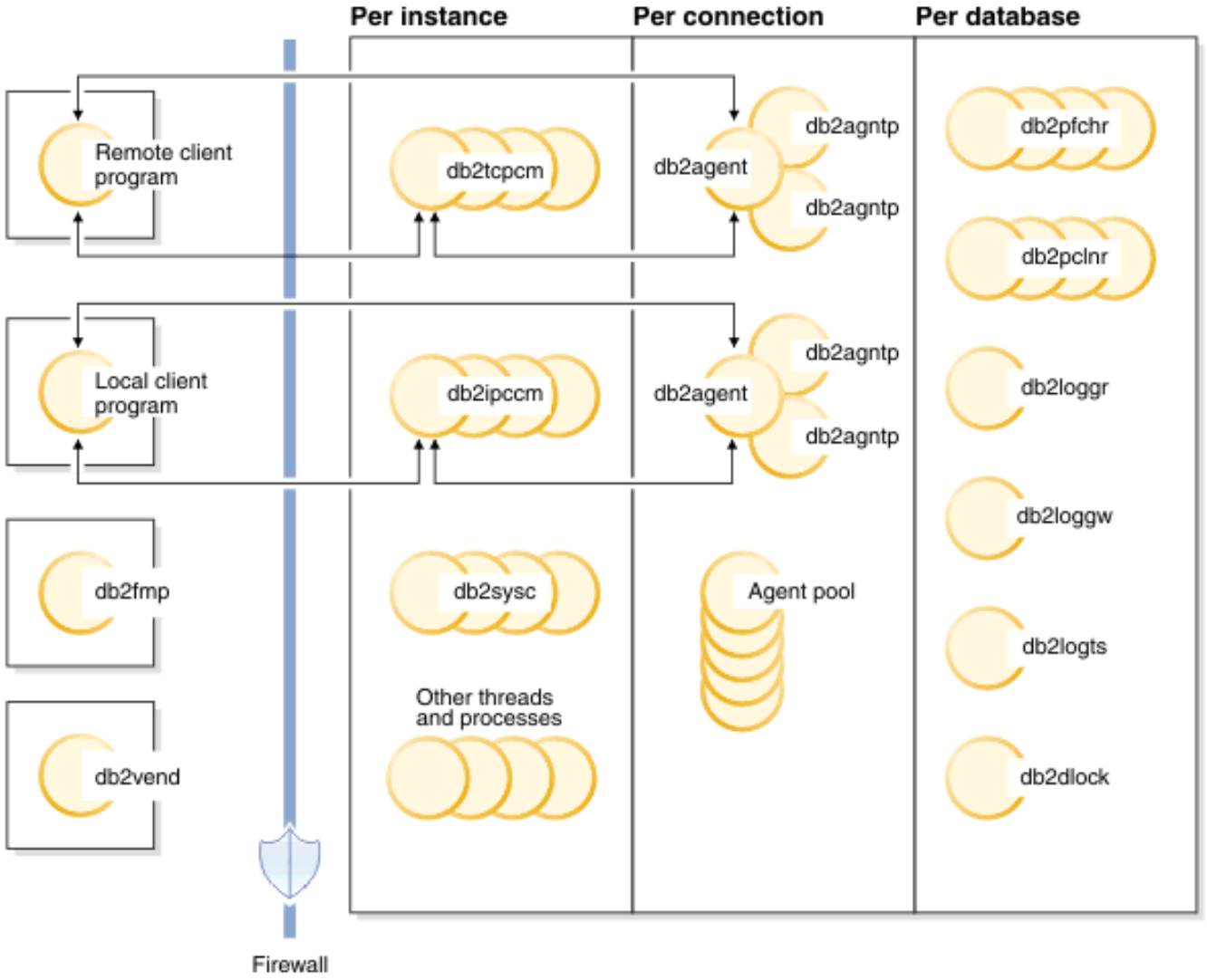
Multithreaded Architecture in DB2

There are many advantages to using a multithreaded architecture for DB2 data server:

- A new thread requires less memory and fewer operating system resources than a process

- The context switch time for threads is less than that for processes

DB2 Process Model - The Big Picture



Listing All EDUS

db2pd -edus

Client Programs & Listeners

Client Programs

- Client programs can be remote or local, running on the same machine as the database server. Client programs make first contact with a database through a **communication listener.**

Communication Listeners

- Communication listeners start when the DB2 database server starts. There is a listener for each configured communication protocol
  - **db2ipccm (IPC – local clients)**
  - **db2tcpcm (tcpip – remote clients)**
  - **db2npcm (npipe protocol -windows)**

EDUs / Agents

An agent can be thought of as a **'worker'** that performs all Database operations on behalf of an application. There are three types of DB2 agents:

- **Idle agents – db2agent (idle)**
- **Active Coordinator Agent - db2agent (db_name)**
- **Subagent - db2agntp**

Database EDUs

The following list includes some of the important EDUs that are used by each database:

- **db2dlock :** for deadlock detections
- **db2loggw :** log file writer
- **db2pfchr :** buffer pool prefetchers
- **db2pclnr :** buffer pool page cleaners

Database Server threads and processes

- The system controller (**db2sysc** on UNIX and **db2syscs.exe** on Windows operating systems) must exist if the database server is to function.
  - **db2sysc**, the main system controller EDU; it handles critical DB2 server events
  - **db2licc**, manages installed DB2 licenses

Related DBM & DB CFG parameters

- **DBM CFG**
  - **NUM_POOLAGENTS :** Agent pool size (max)
  - **NUM_INITAGENTS :** Initial number of agents in pool
  - **MAX_CONNECTIONS:** maximum number of application connections
  - **MAX_COORDAGENTS :** Max number of coordinating agents
- **DB CFG**
  - **NUM_IOCLEANERS :** The number of page cleaners per database
  - **NUM_IOSERVERS :** The number of prefetchers per database

Summary

- DB2 has a multithreaded architecture (Processes & EDUs)
- Process Model (db2pd –edus)
  - Listeners (db2tcpcm & db2ipccm)
  - 3 types of agents (idle, coordinator agents, sub-agents)
  - Agent Pool
  - Database EDUs (prefetchers, page cleaners, log readers/writers etc)
  - db2syscs.exe
- DBM & DB cfg related parameters