Integration with Global Run Control
&
Point 5 Status and Plans

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Where Pixel Online Software Fits In and How:
The Spawning Hierarchy

In the Beginning

- There exists the **Level 0 Function Manager** (Property of the DAQ Group)
- and the **Resource Service Database**, aka RS 3 DB (Stores entire DAQ configurations)

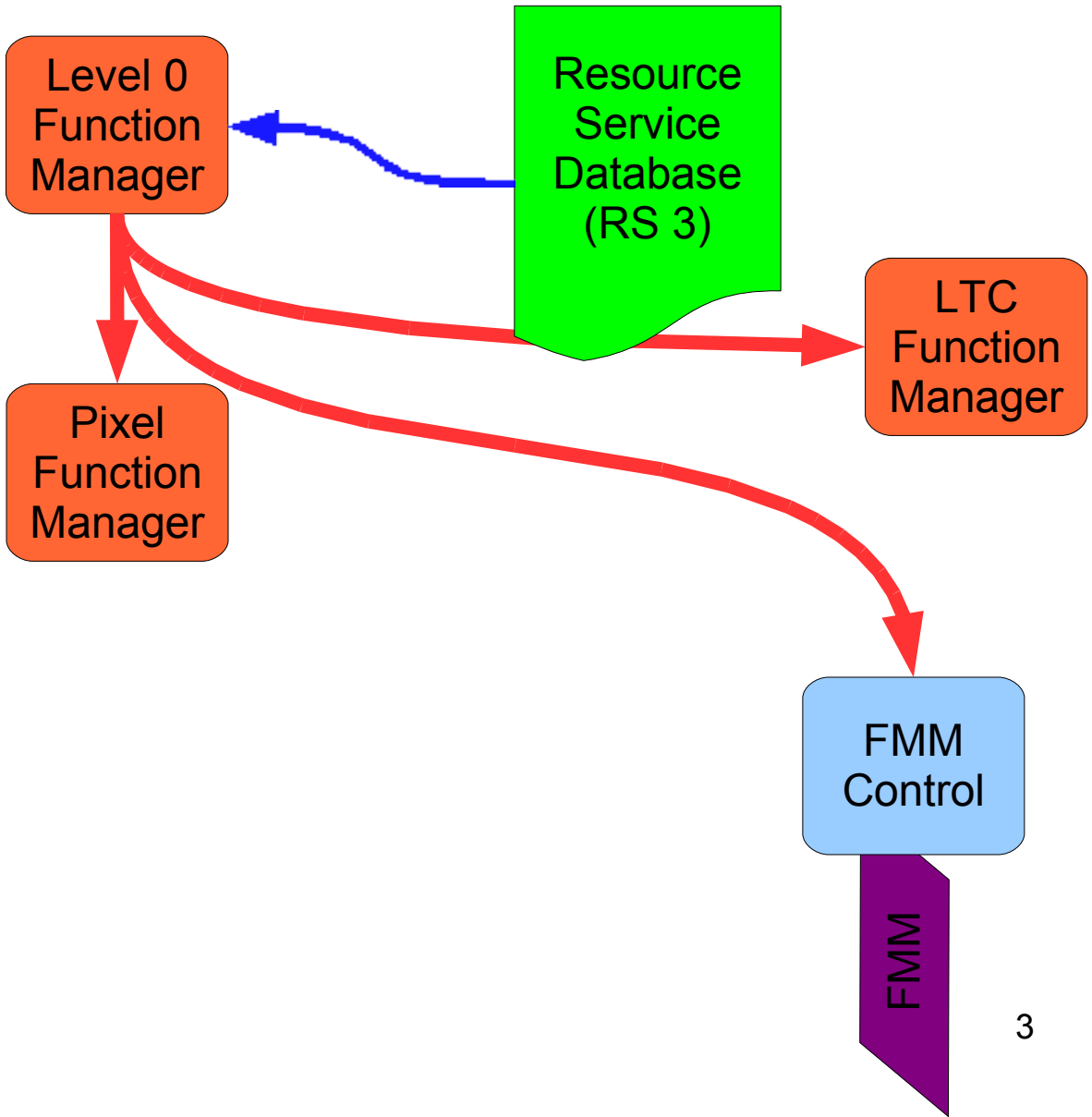
Level 0 Function Manager

Resource Service Database (RS 3)

Where Pixel Online Software Fits In and How:
The Spawning Hierarchy

Initializing – Step 1

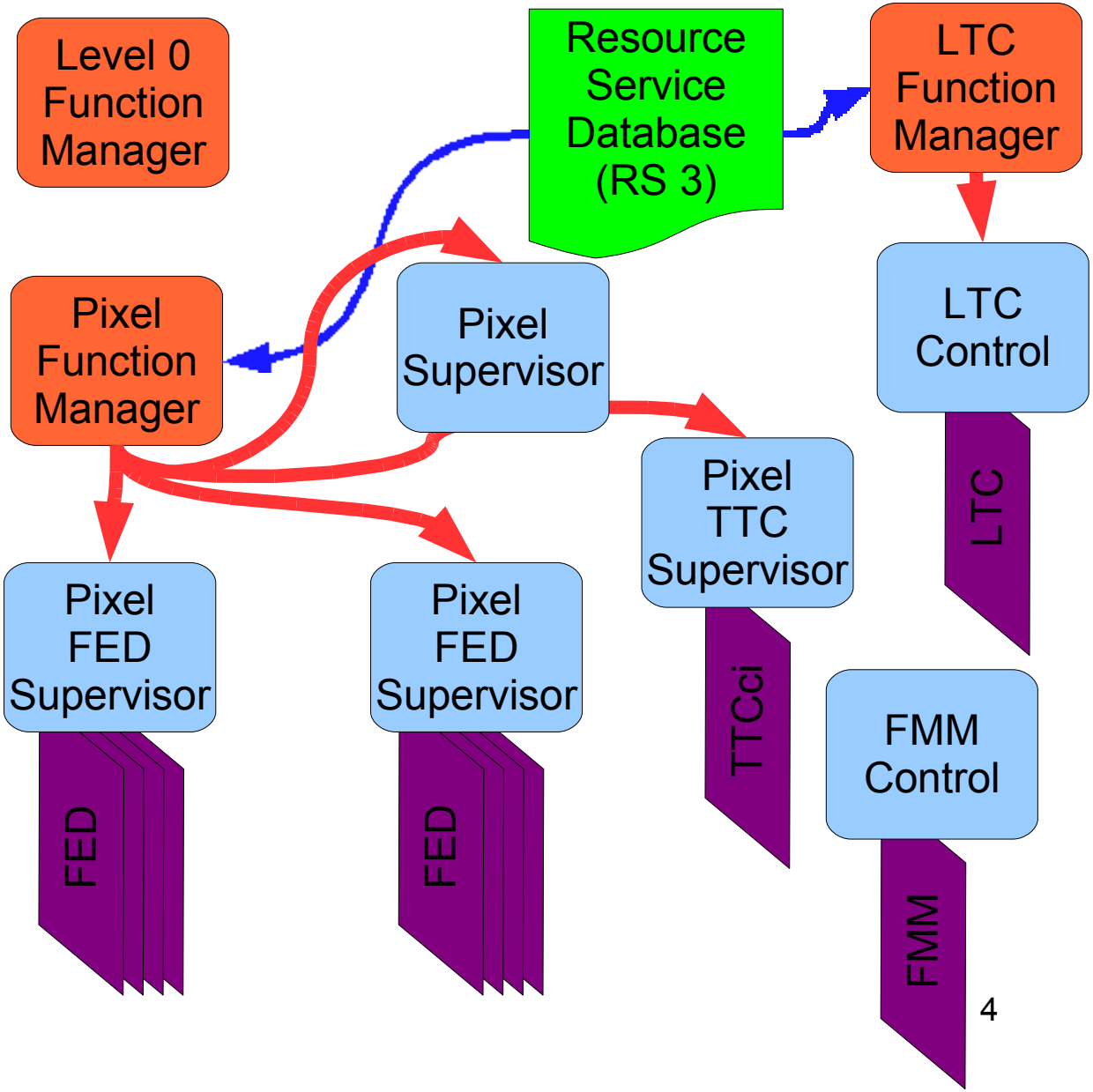
- **Level 0 Function Manager** consults the **RS 3 DB** and spawns:
  - **Pixel Function Manager** on *cmsrc-pixel.cms:370000*
  - **FMM Control** on *fmmpc-s1d12-08.cms:17000* . **FMM Control** directly controls the Fast Merging Modules for the Trigger and Throttling System signals from the FED.
  - **LTC Function Manager** on *cmsrc-trigger.cms:19000*



Where Pixel Online Software Fits In and How:
The Spawning Hierarchy

Initializing – Step 2

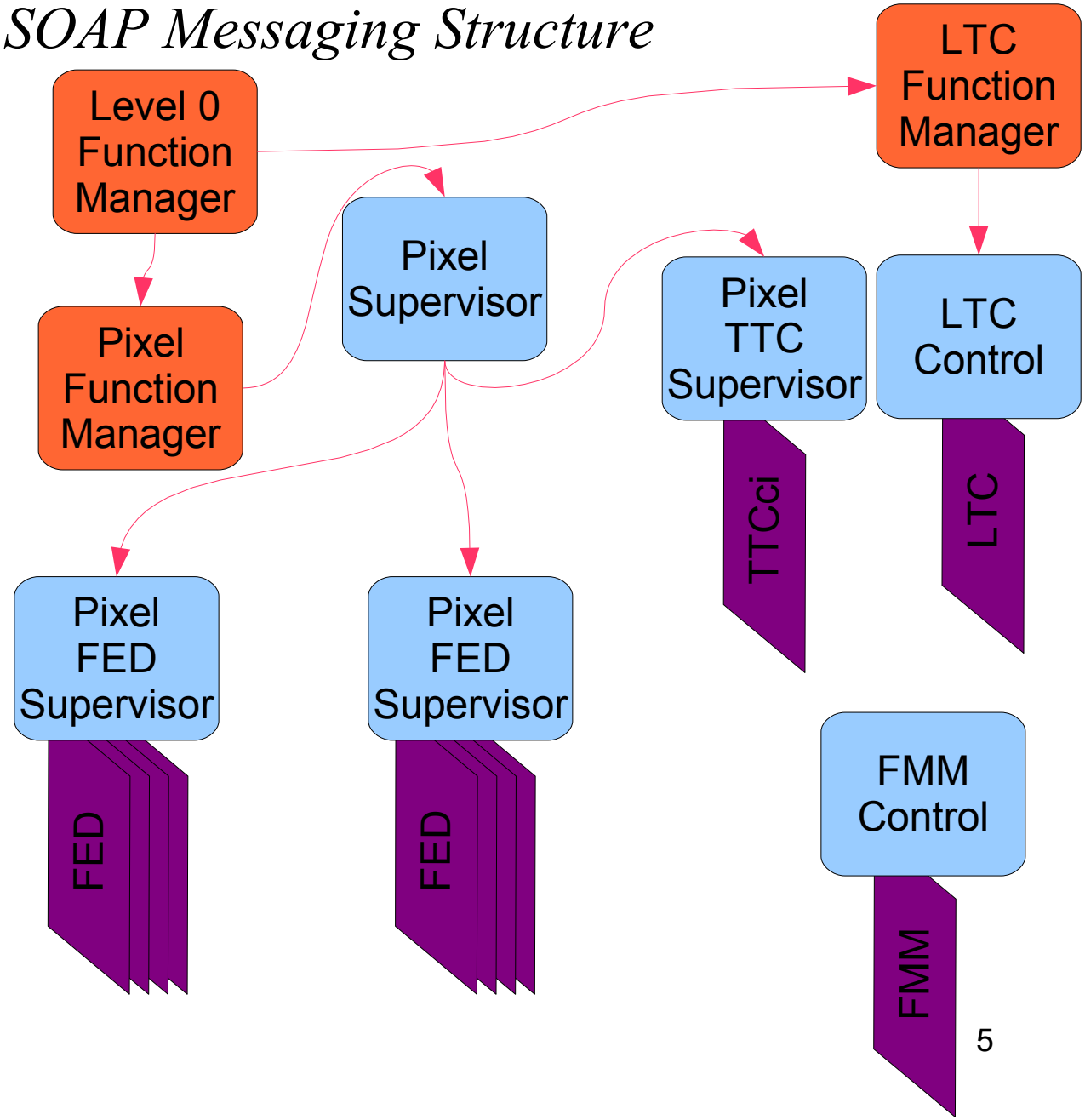
- **Pixel Function Manager consults the RS 3 DB and spawns:**
  - a XDAQ Executive on *vmepcs2b18-11.cms:1973* and loads **PixelSupervisor** on it,
  - a **PixelFEDSupervisor** on *vmepcs2b18-13.cms:1973* and another **PixelFEDSupervisor** on *vmepcs2b18-14.cms:1973* and
  - **PixelTTCSupervisor** on *vmepcs2b16-10.cms:1973*
- **LTC Function Manager** consults the **RS 3 DB** and spawns LTC Control in a XDAQ Executive on *vmepcs2b16-10.cms:1974*



Where Pixel Online Software Fits In and How:

The SOAP Messaging Structure

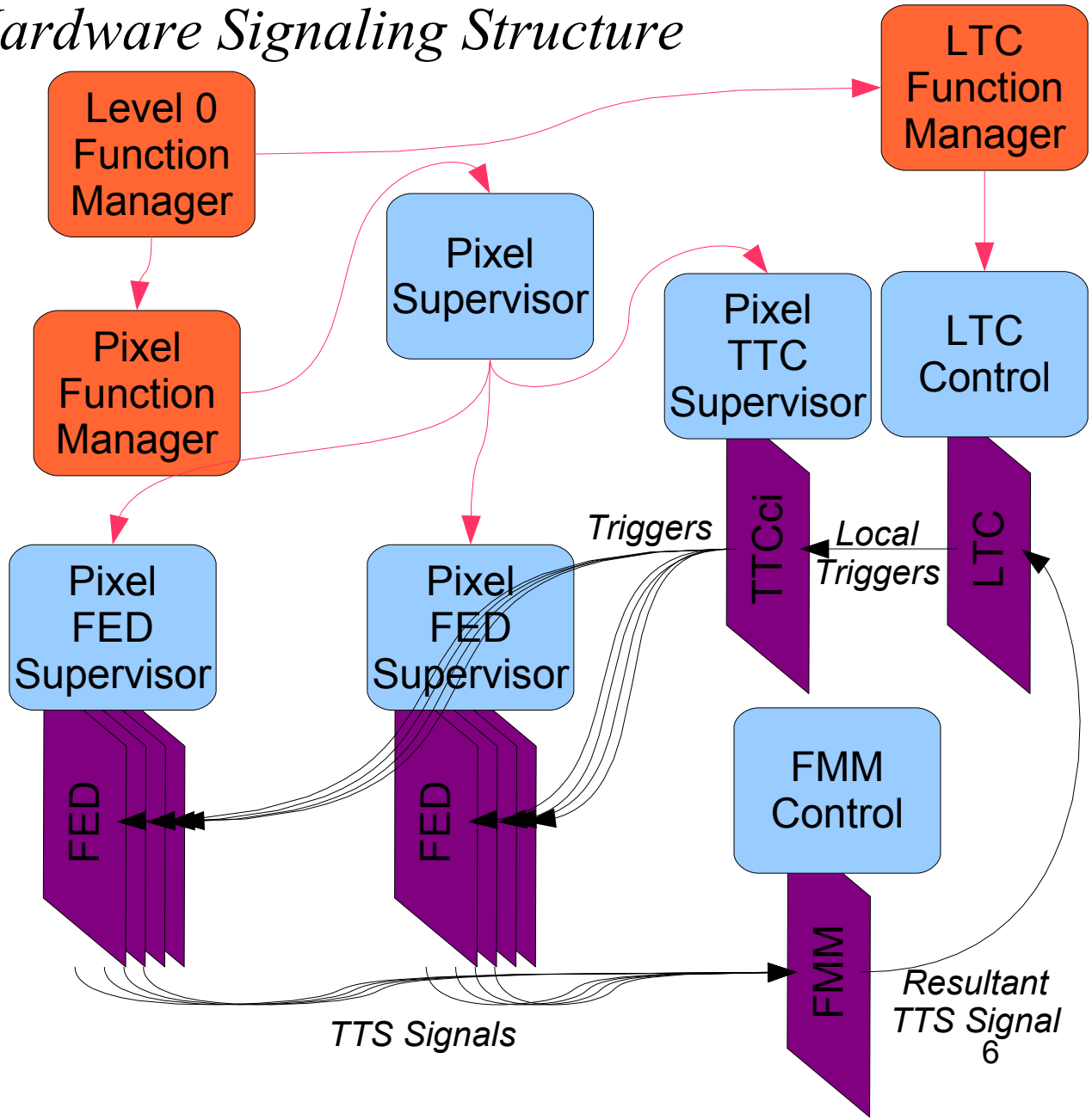
- Finite State Machine commands like “Configure”, “Start” etc come via SOAP messages from **Level 0 Function Manager** to **Pixel Function Manager**.
- **Pixel Function Manager** relays the command to **PixelSupervisor** after which point we can intervene or allow the commands to trickle down further to other Supervisors.
- We can intervene and issue our own FSM and Low Level commands at the level of any Supervisor!



Where Pixel Online Software Fits In and How:

The Hardware Signaling Structure

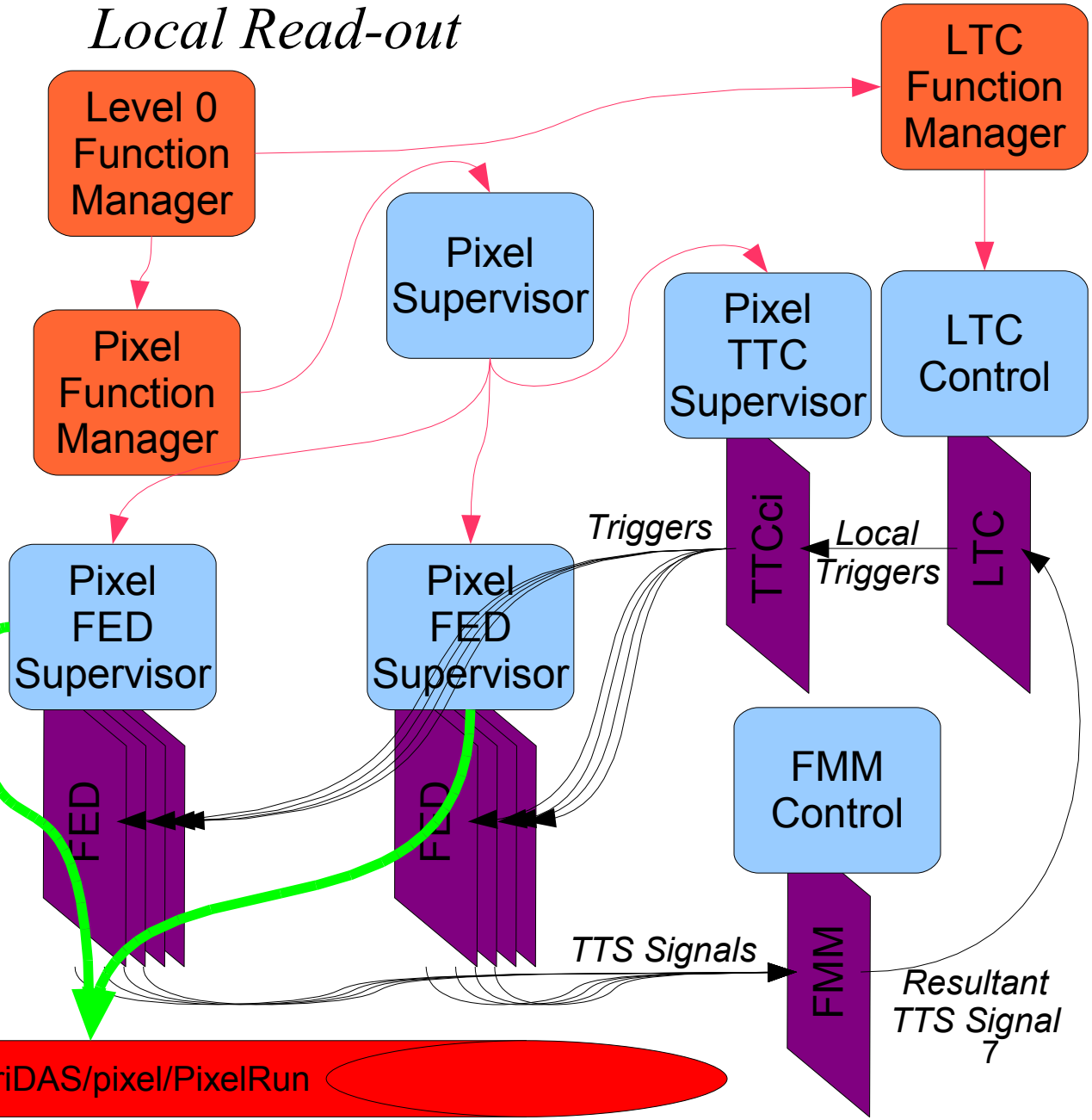
- The **LTC Function Manager** activates Local Triggers as and when required through the **LTC Control**.
- These Local Triggers are distributed by the TTCci to the FEDs (and Pixel-FECs and Tracker-FECs later)
- The FEDs output a Trigger Throttling System signal (that signal data overflow, out-of-sync etc in the FED) which is collected by the Fast Merging Modules
- The FMM effectively OR's those TTS signals and feeds it back to the LTC board in order to slow down the triggers if necessary



Where Pixel Online Software Fits In and How:

Local Read-out

- **PixelFEDSupervisors** read out SpyFIFO 3 of all 32 FEDs and currently dump them in SLink format in our NFS area.
- Rate ~ 2 KB / event with no hits make us hit our NFS quota in a matter of minutes.
- Maybe we should write to VME PCs' disks?

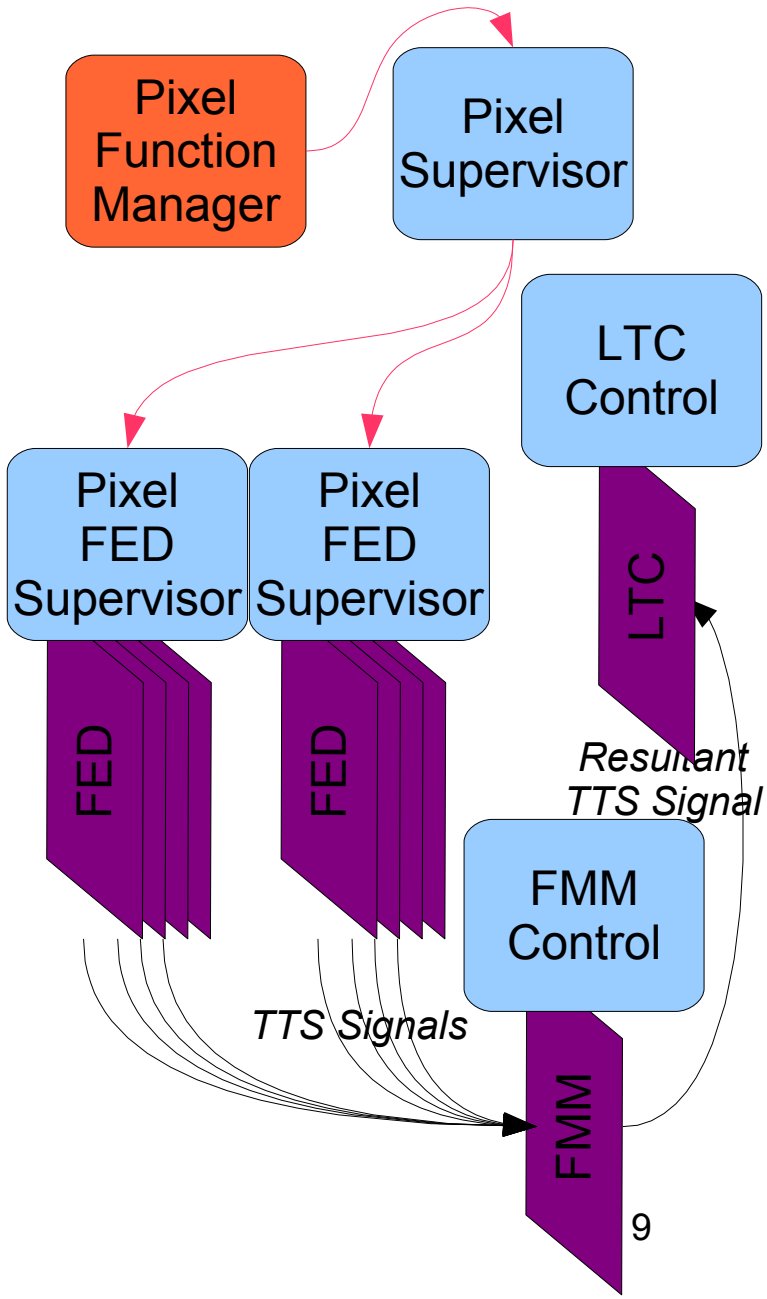


Prerequisites for Participation in a Global Run

- ✔ Pass the TTS Test with Global DAQ
  - 25 October 2007
- ▪ Pass the SLink Test with Global DAQ
  - Scheduled for the Week of 12th November

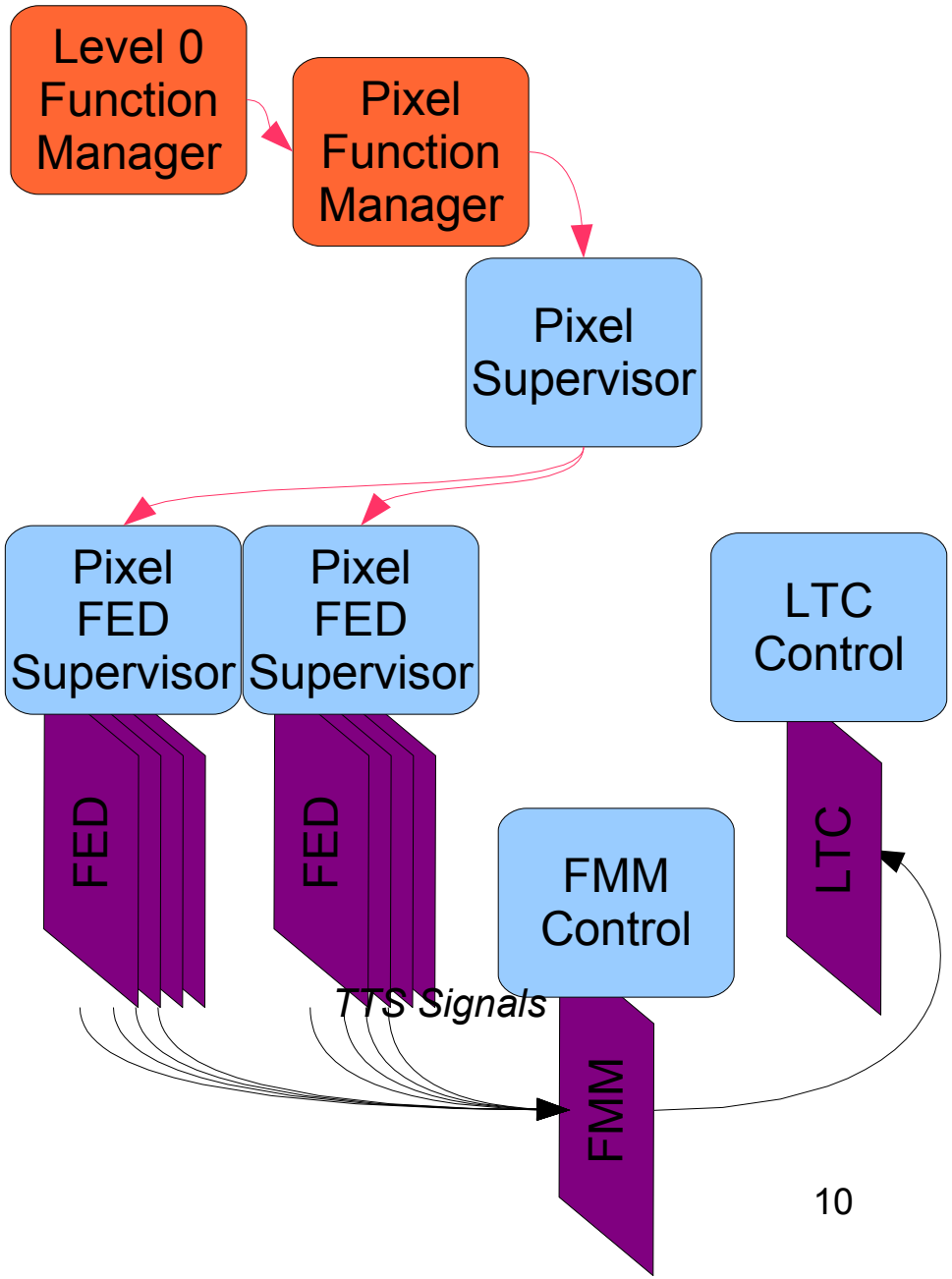
The TTS Test (aka the Connectivity Test)

- **Local TTS Test**
  - Added the FSM states for TTS Testing in **PixelFunctionManager**, **PixelSupervisor** and **PixelFEDSupervisor**.
  - Two **PixelFEDSupervisor**s could be used to fire TTS states of all 32 FEDs.
  - Monitor TTS states of all FEDs using the FMM Controller. FED ID 22 was seen to be broken. (Replaced now.)
  - Made sure that the merged TTS signal was reaching the LTC.
  - **PixelSupervisor** could be used to control both **PixelFEDSupervisor**s. TTS states in all 32 FEDs could be fired from **PixelSupervisor**.
  - **PixelFunctionManager** could be used to spawn XDAQ Executives on 3 CPUs, load **PixelSupervisor** and two **PixelFEDSupervisors** in the appropriate CPUs. **PixelFunctionManager** could hence control **PixelSupervisor** and fire TTS states in all 32 FEDs. (At this point a DAQ Configuration had been created in the *Resource Service* Database.)



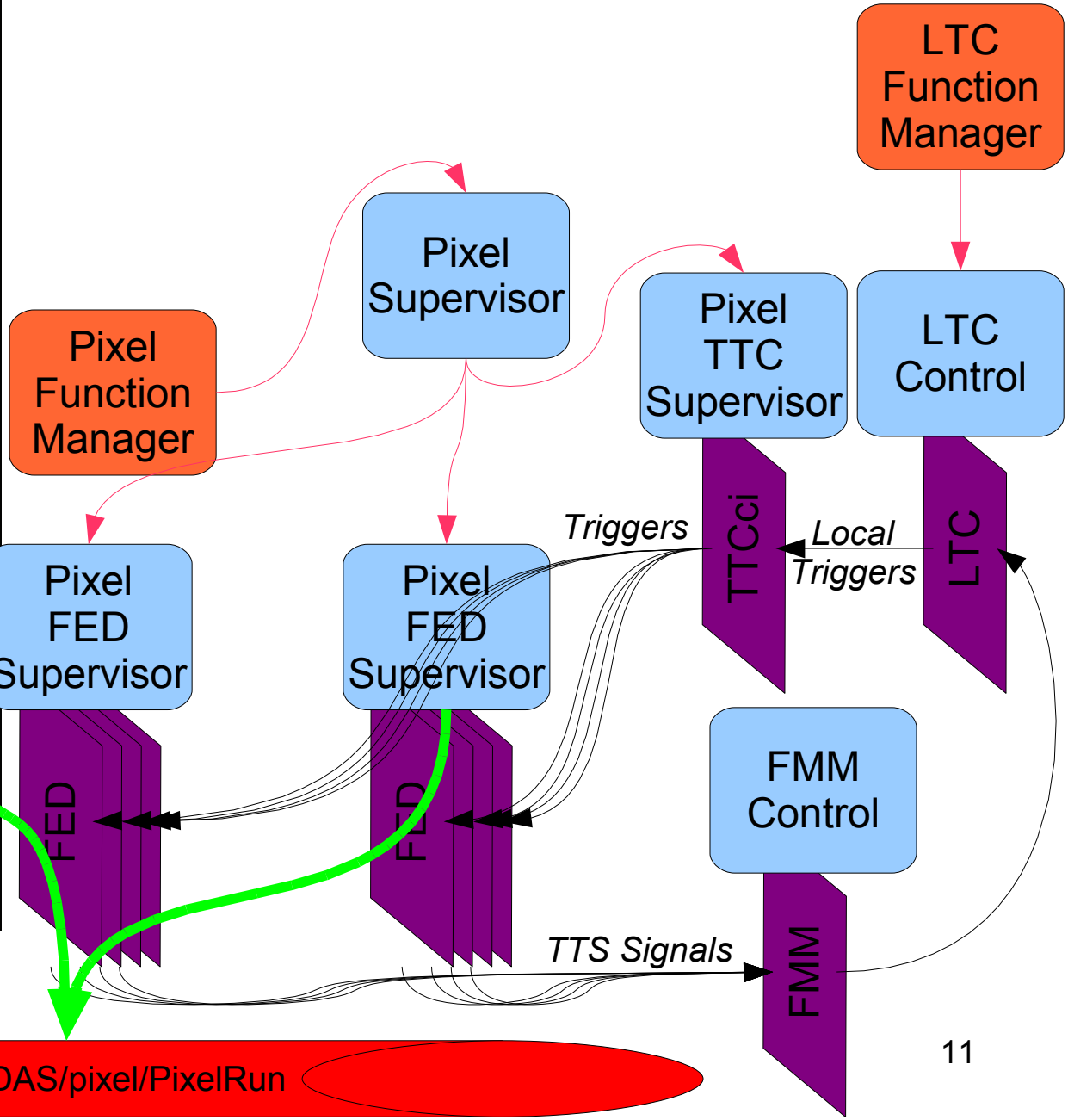
The TTS Test (aka the Connectivity Test)

- **Global TTS Test**
  - ✔Registered our DAQ Configuration as part of the Global DAQ Configuration in *Resource Service* Database.
  - ✔Allowed Global DAQ's **Level 0 Function Manager** spawn our **PixelFunctionManager**, which in turn spawned our **PixelSupervisor** and **PixelFEDSupervisor**.
  - ✔Level 0 FM could send all possible permutations of TTS signals to all the 32 FEDs except # 22 and verified that TTS signals were seen at the FMM.
  - ✔Pixels were certified to have passed the TTS Test.



The SLink Test

- **Local SLink Test**
  - We can Configure and Start a "Physics" run from **PixelFunctionManager**!
  - We can send random triggers from the LTC (which will be controlled by the Trigger Group later) and immediately see data coming on all 32 FEDs with valid SLink Headers and Trailers.
  - We increased random triggers > 500 Khz to see if we can get TTS lines to fire, but in vain.
  - Working towards getting a payload with fake pixel-hits. Involves reviving the Baseline and Address Levels calibration using test-DACs.



The SLink Test

- **Global SLink Test**
  - Data goes to Front-end Readout Link (FRL) at which point it is in the custody of the Global DAQ