

open **PDC**
Version 2.0

The Next Generation PDC

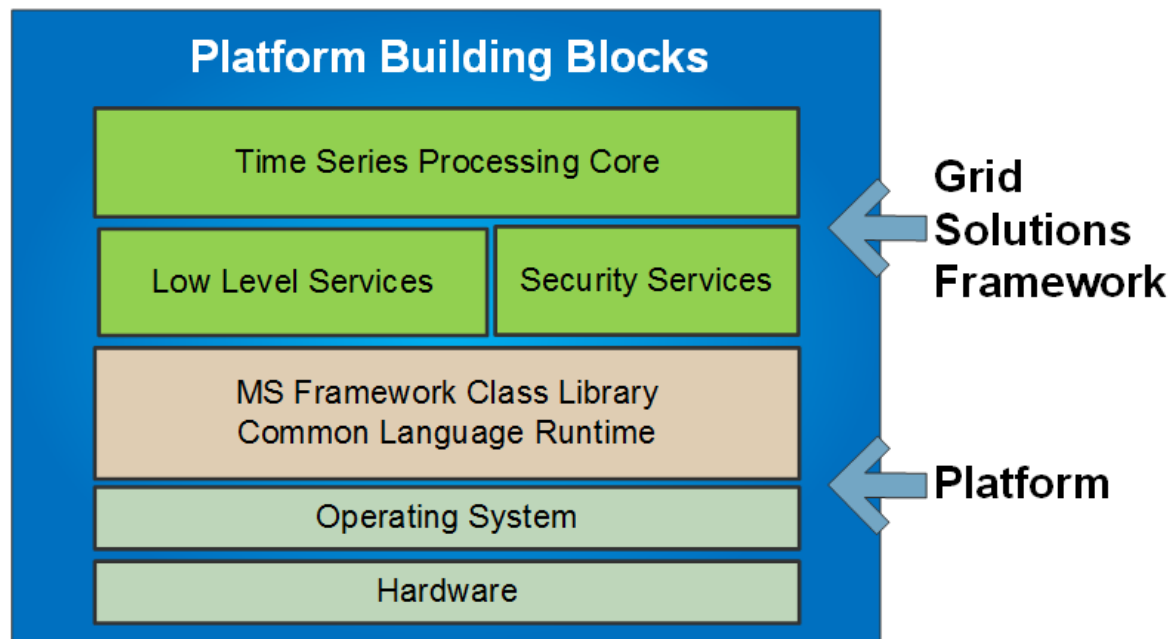
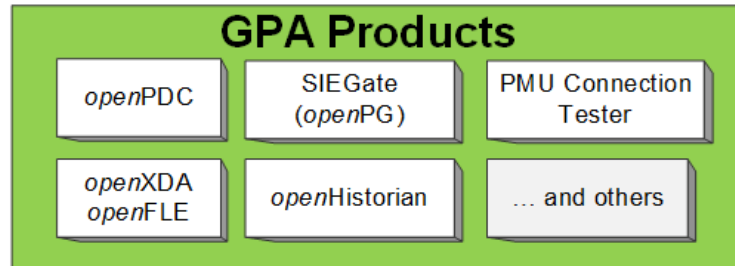
August 14, 2013

Grid Solutions Framework (GSF)

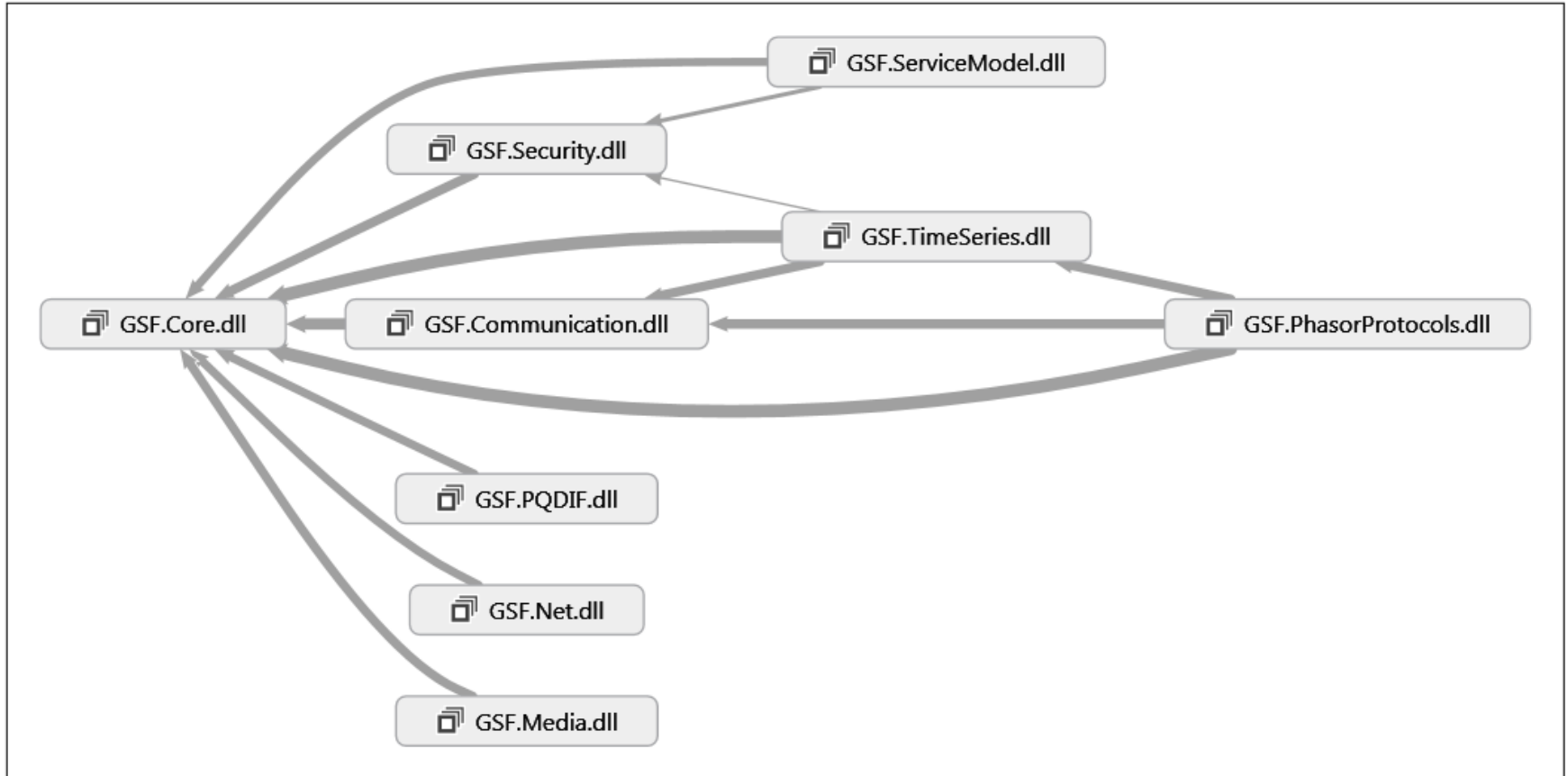
- New software development platform that was initially created as a combination of the Time-Series Framework and the TVA Code Library with a goal to increase performance and security
- Full namespace refactoring and projects targeted to compile with the new Microsoft 4.5 Framework (Released August 2012)
- New core features and improvements are only implemented in the GSF (only a few bug fixes flowed back to the original projects)

<http://gsf.codeplex.com/>

All Latest Products are Built using GSF



GSF Primary Assemblies



**66 Total Assemblies, Over 329,000 Lines of Code and Comments,
200,000 Lines of Code without Comments**

What's New in openPDC 2.0?

- New features are generally divided into three categories:

Performance

Security

Improvements

Performance Improvements

- Major system performance improvements using new asynchronous double-buffered processing algorithms
- Nearly 100% of system calls are now fully asynchronous
- Implemented compression in GEP to reduce bandwidth utilization
- High speed alarm processing updated to handle thousands of defined alarms
- Buffer and stream pooling to reduce GC loading
- Enabling of .NET 4.5 concurrent/server based GC to reduce CPU

Security Improvements

- Security has been integrated into all sub-system components
- Calls to custom adapter methods now respect role based security
- Transport layer security (TLS) is now enabled over AD integrated security by default for all remote console based connections (including openPDC Manager)
- TLS library is integrated as part of GSF base communications library and available in GEP
- Services now use either local NT virtual service or AD managed accounts to limit local machine access
- File permissions access for service access is now limited to installation directory

Other Improvements

- Updated communications library has been extensively tested and debugged in a very wide set of deployment use cases
- COMTRADE exports from Historian Trending Tool (includes support for Annex H of IEEE C37.111-2010)
- Native OSI-PI input and output support
- Vastly improved IP multicast support
- Statistics engine is now easier to extend - allowing simple addition of stats to custom adapters
- GEP subscription API's now include full support for the Unity platform (mono based), plus GSF based updates to C++/Java GEP libraries

Other Improvements, continued...

- Added option for cross-domain access support for Silverlight and Flash application accessing the openHistorian web service.
- Added maximum send queue size to TCP and UDP clients and servers.
- Added send-to capabilities to UDP client.
- Added buffer parsed event to binary image parser base to be used for flow control with protocols that return very large and/or very fast buffers.
- Added maxSendQueueSize connection string parameter to the TCP and UDP clients and servers, which overrides the configuration file parameter if it exists.

Improved Scalability

New overall system improvements and caching in the GSF have allowed great strides in performance improvements for all products. For example, routed data performance is now over 3,350,000 measurements per second before pushing CPU ceiling on off the shelf desktop hardware.

Automated Configuration Exchange

- Metadata now flows automatically from publisher to subscriber when configuration has changed.
- Metadata will only be updated and transferred when relevant changes have been detected.
- Metadata synchronization is now transactionalized (all or nothing – no partial updates) – this also speeds updates.

Simplified System Configuration

The screenshot displays the 'Average Calculator' application window. At the top, it is titled 'Average Calculator' with 'FREQAVG' selected. Below the title is a 'Virtual Device' dropdown menu. The main area is divided into two panes. The left pane contains a table with the following data:

| Signal Reference | Input | Output |
|------------------|-------|---------|
| SHELBY-FQ | PPA:2 | PPA:173 |

The right pane is titled 'Signal Reference' and contains a list of signal references: TVASIEGATE!SOCOSIEGATE!SOCO_OPENPDCIF-NETUNIT-FQ TVASIEGATE!SOCOSIEGATE!SOCO_OPENPDCIF-NETUNIT-FQ. Between the two panes are two arrow buttons: '<<' and '>>'. A 'Close' button is located at the bottom right of the window. The background shows a sidebar with labels like 'Adapter Ty', 'Search Dire', 'Connection', 'Para', and 'Connection'.

Simplified System Configuration

Filter Expression

Selected: 0

Star Search Advanced...

| <input type="checkbox"/> | Point Tag | ID |
|--------------------------|-----------------------|---------|
| <input type="checkbox"/> | TVA_SHELBY-DELL:ABBIH | PPA:12 |
| <input type="checkbox"/> | TVA_SHELBY-BUS1:ABBVH | PPA:6 |
| <input type="checkbox"/> | TVA_SHELBY-BUS2:ABBVH | PPA:8 |
| <input type="checkbox"/> | DEFAULT!SYSTEM:ST3 | STAT:17 |
| <input type="checkbox"/> | DEFAULT!SYSTEM:ST1 | STAT:15 |
| <input type="checkbox"/> | TVA_SHELBY-CORD:ABBIH | PPA:10 |
| <input type="checkbox"/> | DEFAULT!SYSTEM:ST2 | STAT:16 |
| <input type="checkbox"/> | DEFAULT!SYSTEM:ST4 | STAT:18 |
| <input type="checkbox"/> | TVA_SHELBY-BUS2:ABBV | PPA:7 |
| <input type="checkbox"/> | TVA_SHELBY-LAGO:ABBIH | PPA:14 |
| <input type="checkbox"/> | TVA_SHELBY:ABBD1 | PPA:3 |
| <input type="checkbox"/> | TVA_SHELBY-DELL:ABBI | PPA:11 |
| <input type="checkbox"/> | TVA_SHELBY-BUS1:ABBV | PPA:5 |
| <input type="checkbox"/> | TVA_SHELBY-LAGO:ABBI | PPA:13 |
| <input type="checkbox"/> | TVA_SHELBY:ABBD1 | PPA:4 |
| <input type="checkbox"/> | TVA_SHELBY:ABBF | PPA:2 |
| <input type="checkbox"/> | TVA_SHELBY:ABBS | PPA:1 |
| <input type="checkbox"/> | TVA_SHELBY-CORD:ABBI | PPA:9 |

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OK Cancel

Advanced...

Recent Upgrades to 2.0

- MISO
- TVA
- Entergy