IASI Operational Software

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IASI Operational Software

- Context
- OPS design
- Using the OPS
- Porting the OPS
- OPS benchmark
Context

• IASI OPS is part of the EUMETSAT CGS
• IASI OPS developed by CNES & Thales
• SAFNWP has been authorized to adapt IASI OPS for direct reception, and to redistribute it to AAPP users
OPS design (1)

• French C & C++ (40% / 60%)
• POSIX threads
• System calls
• Developed for IBM power4
• Advanced industrial framework
OPS design (2)

- MP: main process
- MSGS: message server
- WOM: work order manager
- SD: data server
- JDBS: log server
- TES: time event scheduler
OPS design (3)

- MP starts and stops all other processes and collects commands
- WOM interprets commands
- SD executes commands
OPS design (4) - Data server

- Session manager handles incoming messages and subdivides them into tasks
- Thread manager dispatches tasks to working threads
- Tasks fall into two distinct categories:
  - *Line*: such tasks can be executed concurrently
  - *Rendez-vous*: such a task must be run separately
OPS design ( 5 ) - execution flow

- IMAGE : radiometric calibration
- ISRFEM : interferometer axis position / spectral calibration / apodisation functions
- FILTERING : of the interferometer axis position
- PRODUCTS : 1A / 1B / 1C
Using the OPS (1)

**INPUTS**
- Level 0 products (from HRPT), PFS L0
- AVHRR 1B (from HRPT), PFS L1B
- Context file (recursive data), binary
- Spectral database (EUMETSAT, TBD), binary
- Configuration files (EUMETSAT, TBD), binary
- Command + Work-Order, xml
Using the OPS (2)

OUTPUTS

- Report file, xml
- Log/HKTM files
- Context file, binary
- Engineering data, PFS
- Verification data, PFS
- 1A, 1B, 1C products, PFS
Using the OPS (3)
Using the OPS (4)
IASI OPS tools

• Libraries & programs for reading, displaying, converting configuration files.

• Library for reading, displaying IASI level 1C

• Library, programs to convert from AAPP 1B AVHRR to PFS 1B AVHRR
Porting the OPS

- System dependent features
- ESSL (IBM scientific library):
  - FFTW (C)
  - LAPACK (F77)
  - NCAR math library (F77)
- Metop Lib: AAPP navigation routines
## OPS benchmark

<table>
<thead>
<tr>
<th>Platform</th>
<th>Seconds / 3 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>altix-4cpu-linux-gcc-3.2</td>
<td>164.</td>
</tr>
<tr>
<td>altix-4cpu-linux-icc</td>
<td>92.</td>
</tr>
<tr>
<td>v40z-4cpu-linux-gcc-3.3</td>
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<tr>
<td>v40z-4cpu-linux-icc</td>
<td>105.</td>
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<tr>
<td>v40z-4cpu-solaris-cc</td>
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<tr>
<td>v40z-4cpu-solaris-gcc-3.3</td>
<td>122.</td>
</tr>
<tr>
<td>pc-2cpu-2Ghz-linux-gcc-3.4</td>
<td>235.</td>
</tr>
<tr>
<td>ibm-4cpu-power4</td>
<td>91.</td>
</tr>
</tbody>
</table>
OPS port validation

- Validation against various cases provided by CNES
- Sounder and imager radiances reproduced with utmost accuracy
- Geolocation data reproduced with 1/1000 degree error
- In the process of validating against EUMETSAT test orbit