

Grid Enablement of 'DMSAR' - An Experimental Study

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&
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Outline

I. Introduction: DMSAR SYSTEM

- Objective
- What is DMSAR ?
- SAC DMSAR System

II. Porting to GRID (Grid Enablement)

- Why Grid ?
- MPI Implementation
- Components Grid Enabled DMSAR System

III. Running the application

- Processing the DMSAR data

IV. Conclusion

INTRODUCTION

- Objective
- What is DMSAR ?
- SAC DMSAR System

- **Development & Deployment of the Grid enabled Disaster Management Synthetic Aperture Radar (DMSAR) Processing Software.**
- **Development of relative Automatic Mosaic Tool**

What is DMSAR?

SAC DMSAR System

SAC DMSAR System (Contd ...)

SAC DMSAR System (Contd ...)

Grid Enablement of DMSAR

- Why Grid ?
- MPI Implementation
- Components Of Grid Enabled DMSAR System

Why Grid ?

Why GRID ?

- Data management:
 - Large amount of data of different sources, different owners, different access right
- Computation power:
 - Requires large computational power for modeling and simulation
- Cooperation:
 - Cooperation between many organizations (meteorological institutes, river authorities)
- For critical situations, short response times are very important
- Many multidisciplinary simulations are needed for flood Assessment & forecasting

GARUDA can offer the Strength of Data Grid & Power of Computational Grid

Why MPI ?

- Threaded Version of DMSAR Code
 - Runs on single node of the Cluster
 - Cannot utilize other idle nodes of the Cluster
 - Takes more execution time
- GARUDA resources are 2/4/8 CPU, SMP Clusters
- Using MPI

Implementation of DMSAR

- MPI
 - Improved the performance (reduced Execution time)
- Started for MPI, ended with hybrid (MPI + OpenMP)
 - Each node of the Cluster - one MPI Process
 - Each MPI Process spawn #threads = #CPUS
- Limitation
 - The cluster should be NFS mounted
 - To reduce the communication of huge data bet'n processes

Components of CDAC - SAC Grid Enabled DMSAR System

Running the application

- Processing the DMSAR data

Data Acquisition

Workshop on Developing Applications on Grid - GARUDA

Raw data Transfer

Workshop on Developing Applications on Grid - GARUDA

Raw data Splitting & Initialization

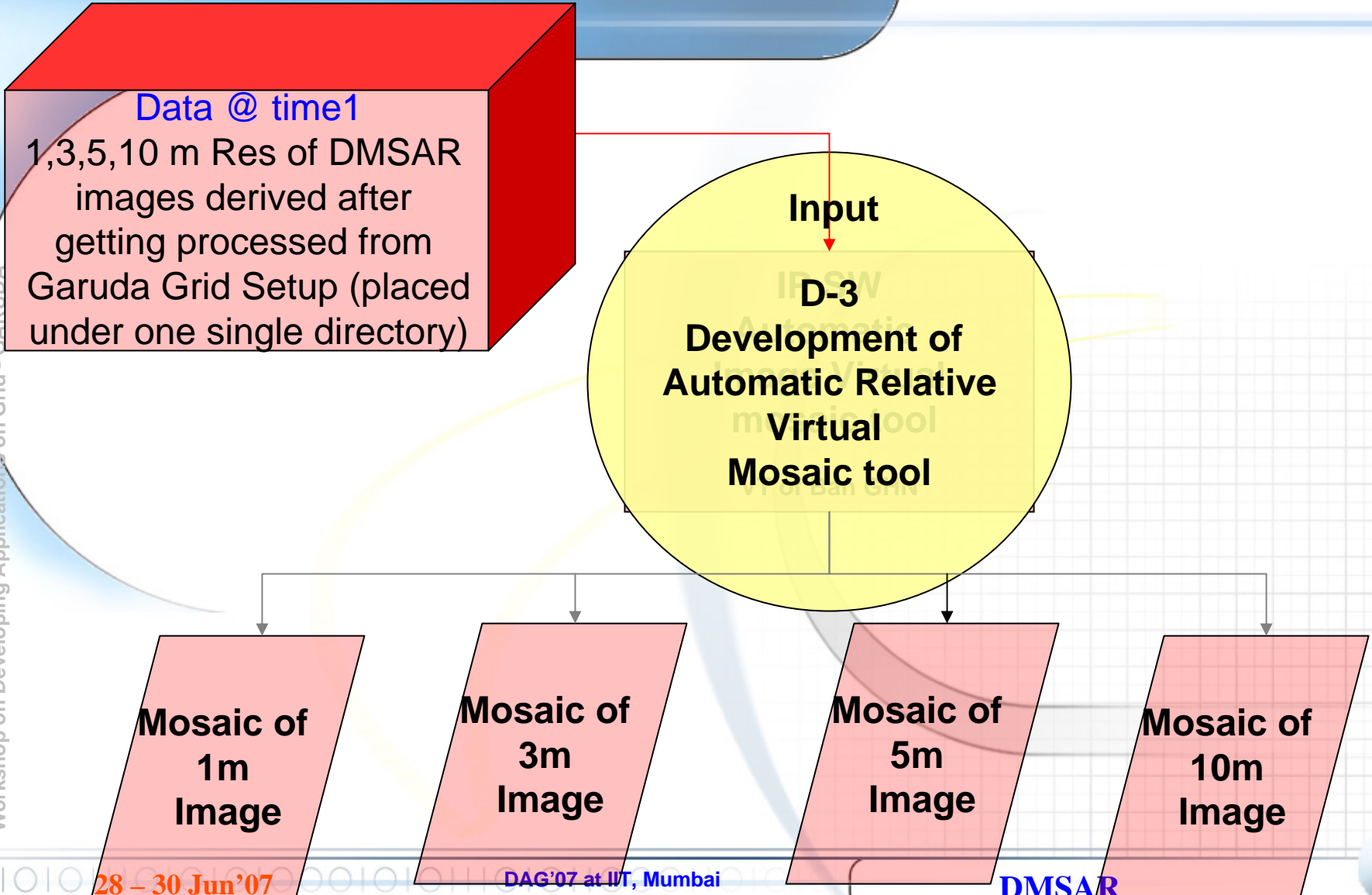
Workshop on Developing Applications on Grid - GARUDA

DMSAR Raw data Processing

Workshop on Developing Applications on Grid - GARUDA

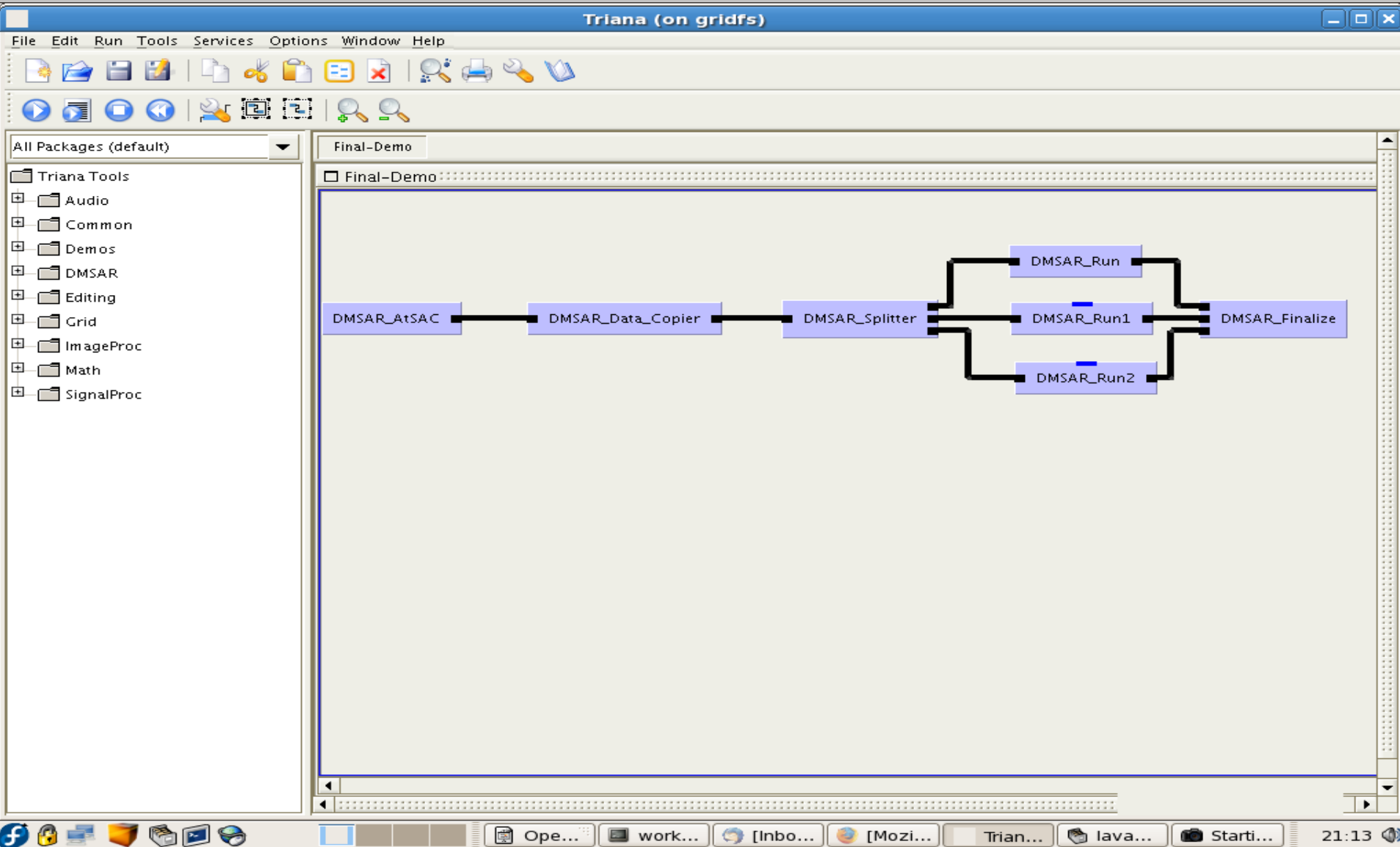
Backward Transfer of Results

Automatic Relative Virtual Mosaic tool



Experiments Carried

- **Triana (Workflow tool) has been used to automate the the process (splitting, submit, results transfer)**
- **Nodes used**
 - **C-DAC Bangalore : TF Cluster and Xeon Cluster**
 - **C-DAC Pune : Xeon Cluster**
 - **C-DAC Chennai : Xeon Cluster**
 - **IGIB Delhi : Xeon Cluster (64 bit)**
 - **C-DAC Hyderabad : Xeon Cluster**



Conclusion

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Thank you!

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