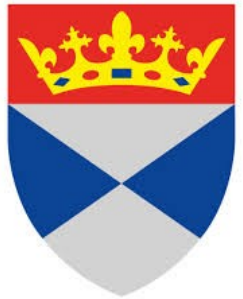




Synaptic Assimilator

Andreas F. Vermeulen
30 August 2015

The Problem:

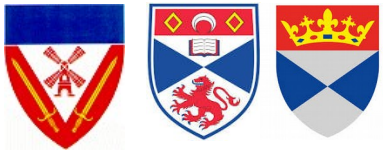
What happens when exascale computing executes commodity building block and heterogeneous data processing and computing solutions uses information?

Research Question:

What happens when exascale computing executes data processing and computing solutions uses commodity building block and heterogeneous computing processes to convert data into information?

Exascale Computing:

Exascale computing is systems capable to support over one exaFLOPS of data processing.



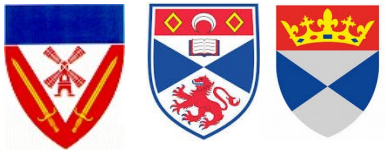
Synaptic Assimilator

The solution is a one million processor ecosystem that processes data sets in the exabyte (10^{18}) range and the system uses embedded heterogeneous computing that is assembled by an artificial control system from a range of pre-optimised processing building blocks.

Rapid Information Factory

The concept of a factory is well known to the world of mass production in manufacturing.

The RIF uses the same principals that is used in mass production in the commodity market to guide the processing of the data into information.



Rapid Information Factory

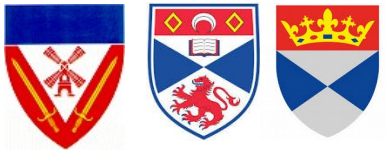
The factory consists of two halves:

Rapid Information Factory Framework

The framework guides the processing of data into information using pre-optimised processes.

Rapid Information Factory Cluster

The cluster is a pre-optimised processing solution that is processing the data into information.



Rapid Information Factory Framework

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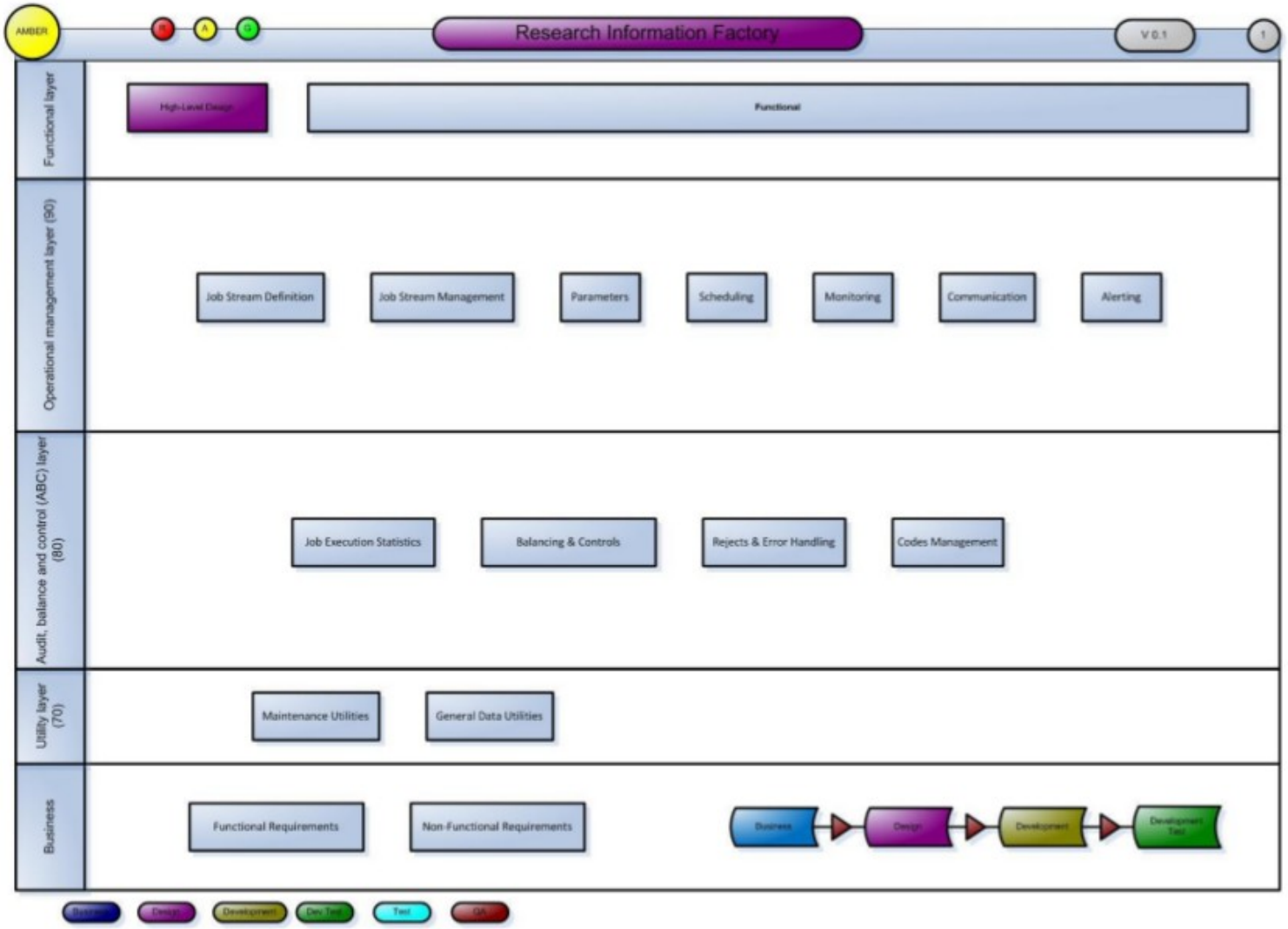
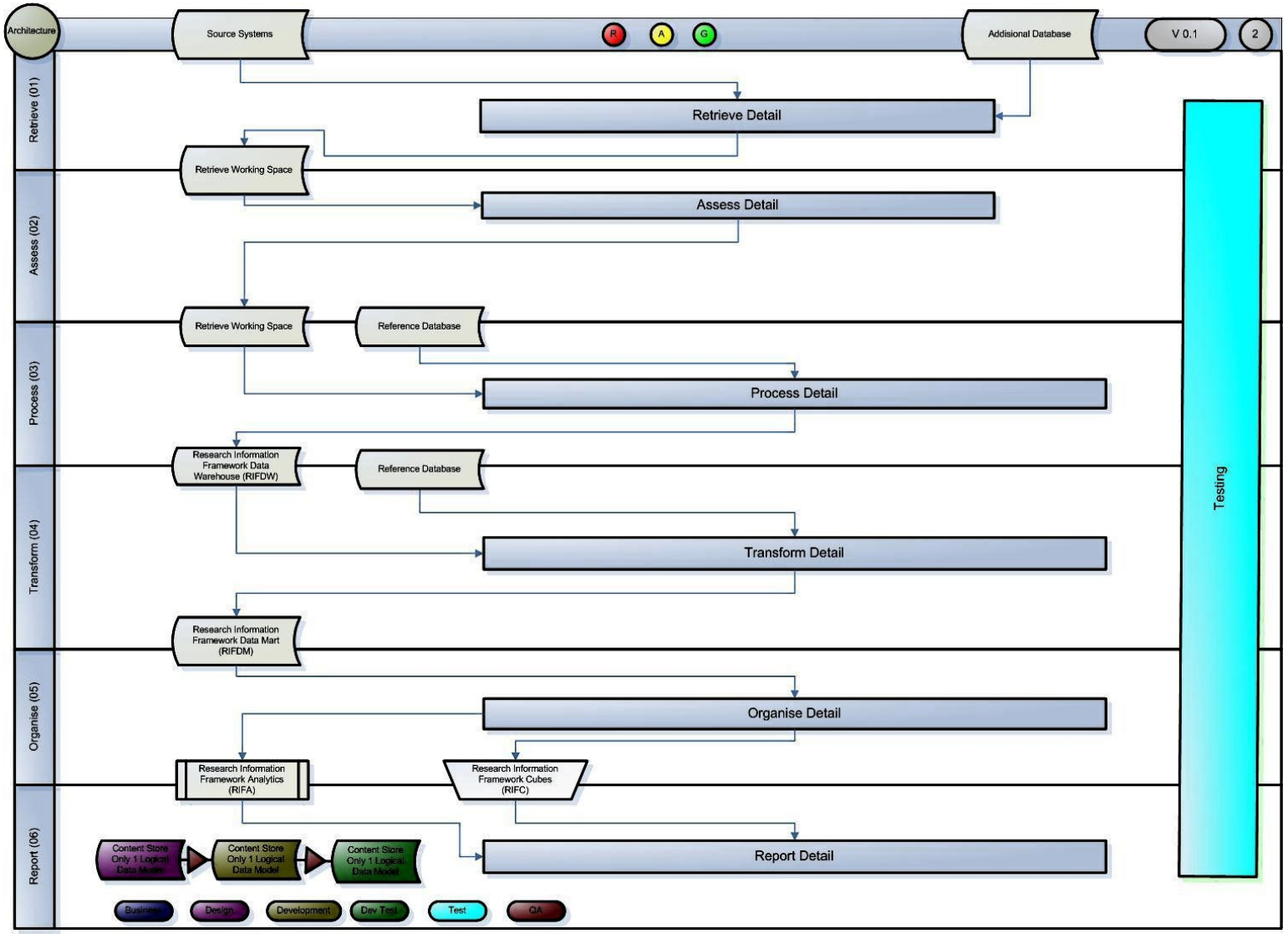
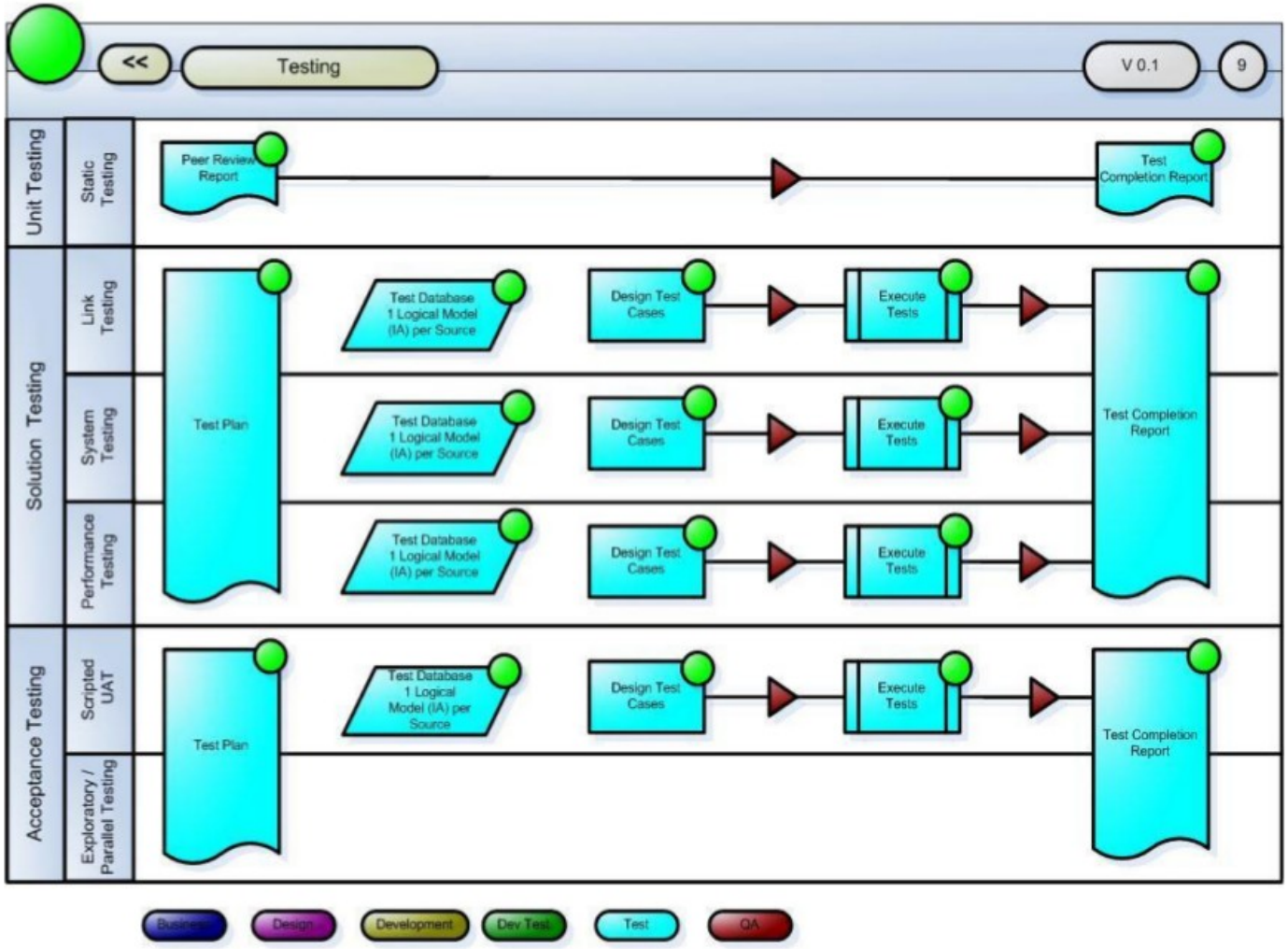
Rapid Information Factory Framework



Rapid Information Factory Framework



Rapid Information Factory Framework



Rapid Information Factory Framework

5S is a workplace organization technique composed for five primary phases: Sort, Set In Order, Shine, Standardize, and Systematize.

Rapid Information Factory Framework

D	Defects
O	Overproduction
W	Waiting
N	Non-Utilized Talent
T	Transportation
I	Inventory
M	Motion
E	Extra-Processing

Defects

Efforts caused by rework, scrap, and incorrect information.

Overproduction

Production that is more than needed or before it is needed.

Waiting

Wasted time waiting for the next step in a process.

Non-Utilized Talent

Underutilizing people's talents, skills, & knowledge.

Transportation

Unnecessary movements of products & materials.

Inventory

Excess products and materials not being processed.

Motion

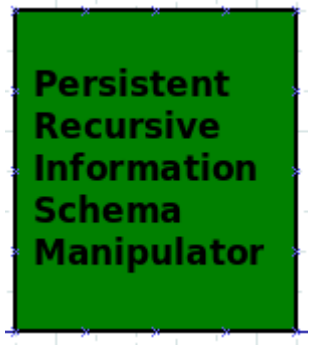
Unnecessary movements by people (e.g., walking).

Extra-Processing

More work or higher quality than is required by the customer.

Rapid Information Factory Framework

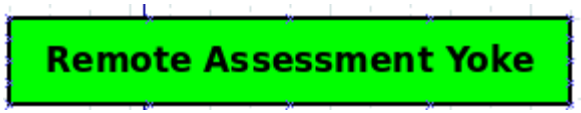
Persistent Recursive Information Schema Manipulator



The PRISM is the main process that drives a specific chain of processes that together forms the required work cells to convert the data into information by applying the RIFF rules of processing.

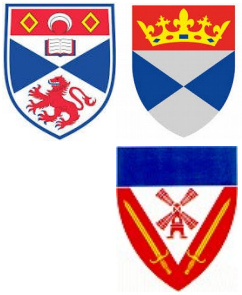
Rapid Information Factory Framework

Remote Assessment Yoke

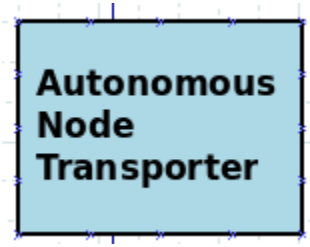


The RAY is a “Poka-yoke” from Lean manufacturing to avoid mistakes in the work cells while conversion of the data into information by applying the RIFF rules of processing.

Rapid Information Factory Framework



Autonomous Node Transporter



The ANT is the software stack required to run any predefined hardware process and software combination from the RIFF library of processing configurations.

Rapid Information Factory Framework

Persistent Uniform Protocol Agreement

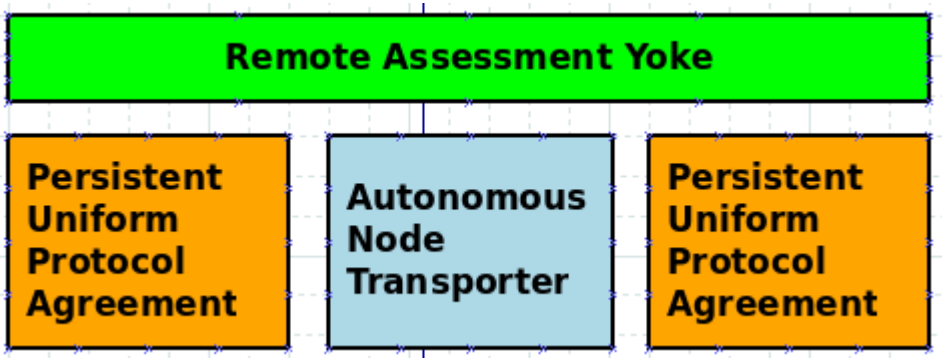
The PUPA is the software stack required to run any predefined Algorithms that is formed from self-contained step-by-step set of operations to be performed.

PUPA performs calculation, data processing, and automated reasoning using uniform processes from the RIFF library of processing configurations.

PUPA can consist of other PUPA to form processing chains.

Rapid Information Factory Framework

Remote Work Cell

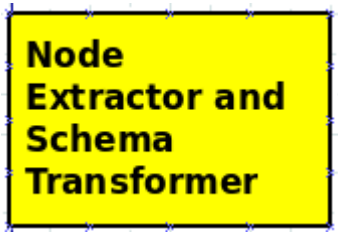


The RWC is a group of processes that has a singular purpose of work in the same manner than a Lean Work Cell.

The cell consists of four parts:
- RAY
- PUPA (inbound)
- ANT
- PUPA (Outbound)

Rapid Information Factory Framework

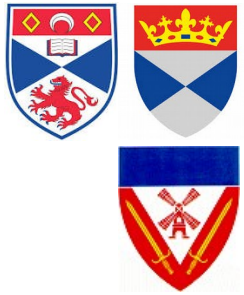
Node Extractor and Schema Transformer



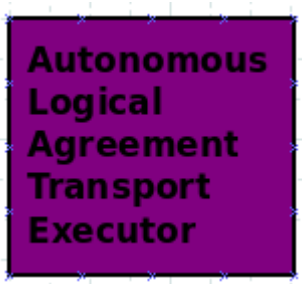
The NEST is a specialised software stack required to enable a ANT to communicate with a specific type of data source.

NEST will be designed for data sources and published in as uniform processes in the RIFF library.

Rapid Information Factory Framework



Autonomous Logical Agreement Transport Executor



The ALATE is a specialised software stack required to enable a ANT to discover which PUPAs will be required to perform the R-A-P-T-O-R process for a new NEST.

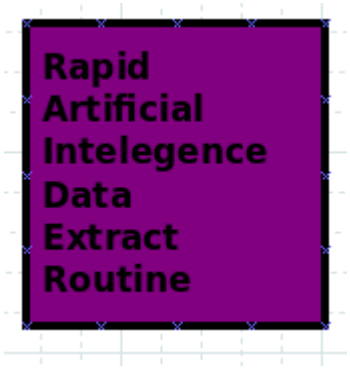
Rapid **I**nformation **F**actory **F**ramework

Sequential **C**onverter into **O**ntology for **U**niform **T**ransport

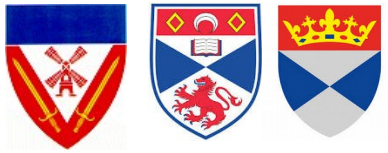
The SCOUT is a specialised software stack required to enable a ANT to convert meta data from a NEST into HORUS PUPA for R-A-P-T-O-R process to use.

Rapid Information Factory Framework

Rapid Artificial Intelegence Data Extract Routine



The RAIDER is a specialised software stack required to enable a ANT to mine data from a NEST into HORUS PUPA procedures for R-A-P-T-O-R process to use.

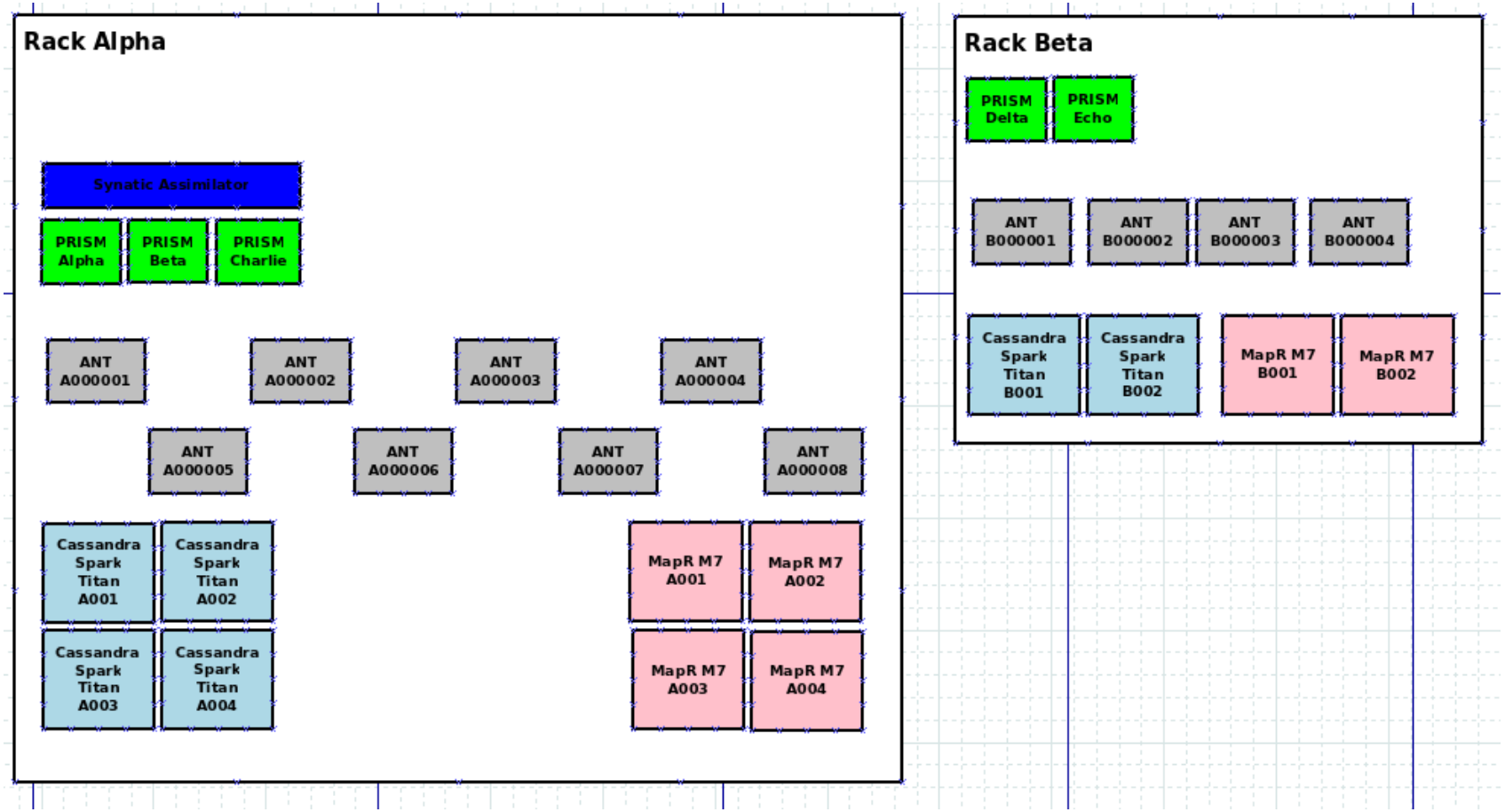


Rapid Information Factory Cluster

The cluster is a pre-optimised processing solution that is processing the data into information.

Rapid Information Factory Cluster

Rapid Information Factory Cluster



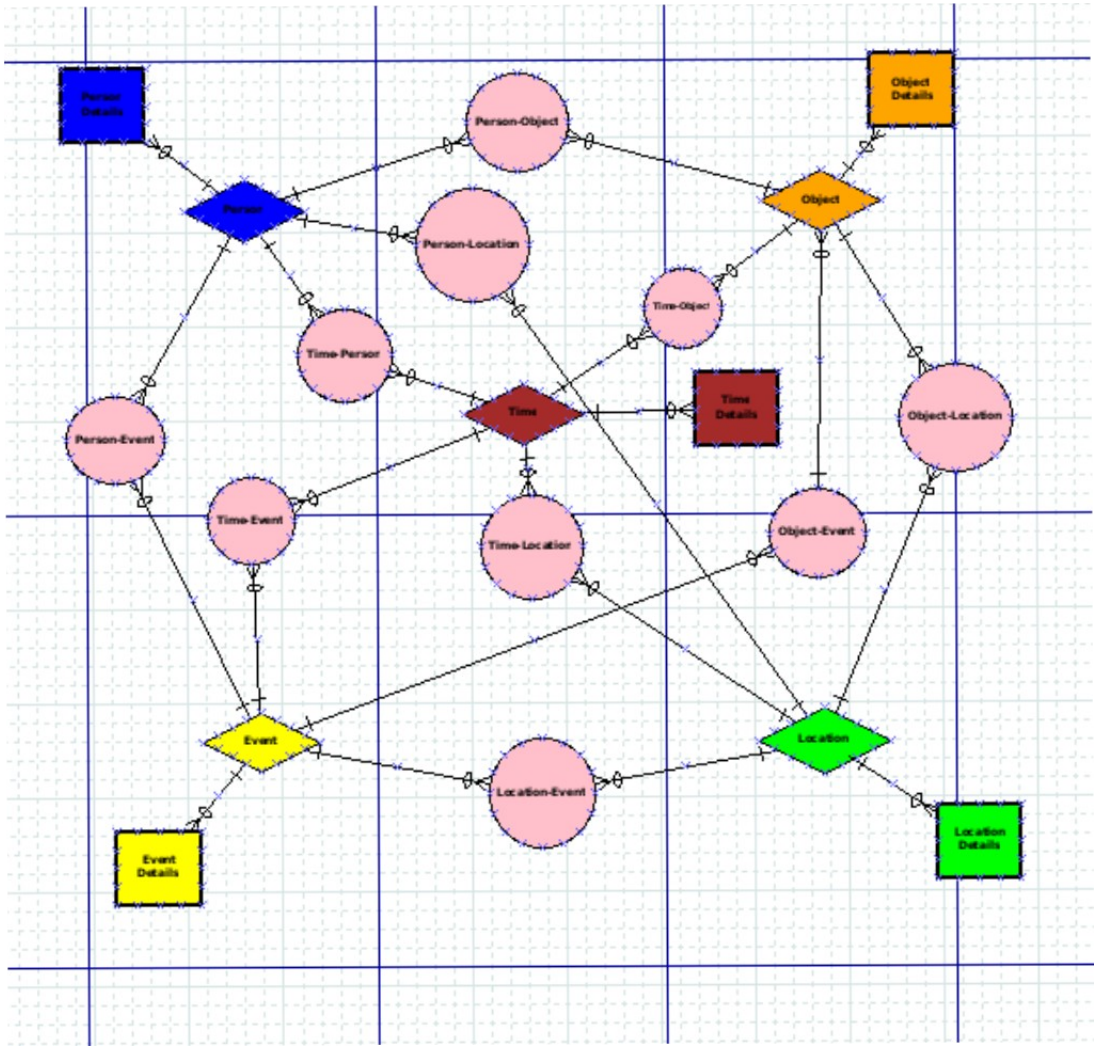
Time

People

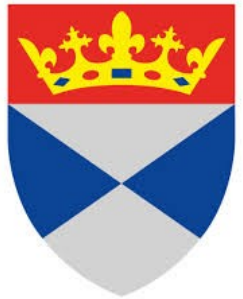
Organisation

Location

Event







Thank you

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