

Servers' technical specification

- Processors
 - Cores, frequency and features
- Interconnects
 - Sockets, PCIe lanes, etc.
- Memory
 - Capacity, bandwidth and channels
- Storage
 - Type, capacity and bandwidth
- Network
 - Bandwidth and features (e.g.: RDMA)
- Chipset & mainboard
 - Features (e.g.: on-board accelerators)

	Minimum Requirements	Recommended Requirements
Drive type	HDD	SSD
CPU	4 cores (8 logical threads), frequency - 3-3.5 GHz and more	8 cores (16 logical threads), frequency - 3.5 GHz or more
RAM	8 GB or more	32 GB or more
Free disk space	200 GB or more	500 GB or more
Network interface bandwidth	100 Mbps	1 Gbps
HDD for IIS and documents	64 Gb	128 Gb

A database use-case oriented server spec.

Approach diagram

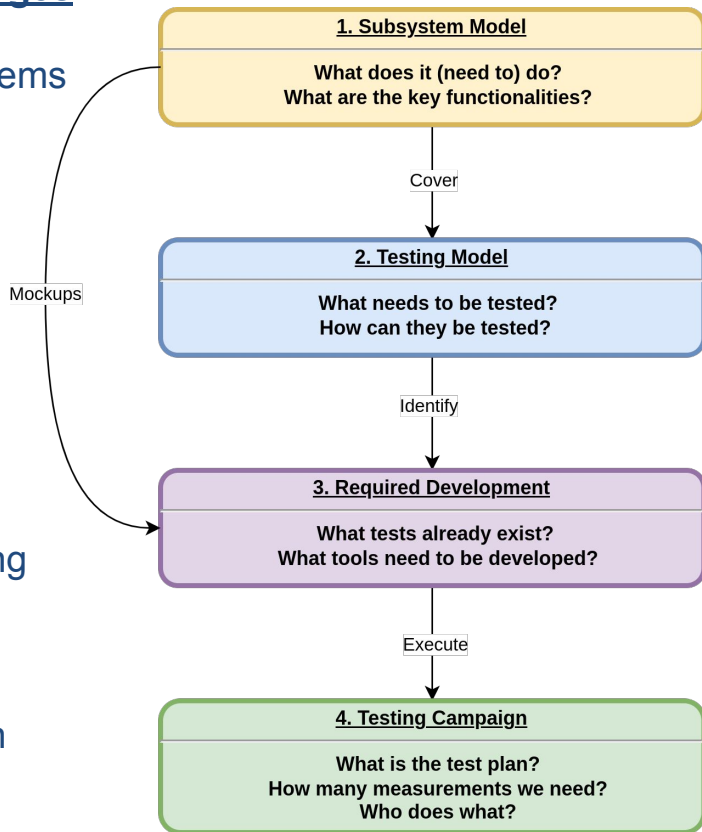
Assessment stages

1. Model of subsystems

2. Model for testing

3. Developments required for testing

4. Testing campaign



Expected outcome

1. List of components and functionalities mapped to server spec. needs

2. Methods for quantifying the resources needs

3. Tools to be developed tied to a list of tests

4. Test plan for measurements we need for assessment

Example - Readout Unit

Component	Devices and interconnects	CPU	Memory	Persistent storage
Data reception	NICs and PCIe lanes	sensitive	sensitive	
Latency Buffer	Memory and its channels	marginal	sensitive	marginal
Data processing	CPU and cache lines	sensitive	sensitive	
Supernova Burst Data Store	Persistent storage	marginal	sensitive	sensitive

- List of components mapped to server spec. needs



- Methods for quantifying the resources needs

- Tools to be developed tied to a list of methods

Green: Developed
Red: Refinement needed

- Test plan for measurements tied to tools and methods
- OK or ongoing:

Components/ what needs to be tested	Device feature and interconnects	CPU utilization	Memory utilization	Storage utilization
Data reception	Can be calculated, Acceptance tests of 100Gb NICs 	Test 1.: DPDK reception Test 2.: Copy vs. callback Test 3.: integrated system no missed/dropped packets 	Can be calculated, cross-checked with PCM (~10GB/s per 100G) 	
Latency Buffer	Can be calculated, Max bandwidth I/O 	Test 1.: Prod/consumer/request rate stress tests	Can be calculated, Test 1.: maximum throughput tests	Tests: filewriter and LB to drive via zero copy
Data Processing	Cache size and locality sensitive, AVX2 capable CPU 	Tests: TPG algo., emulator tests, TPG rate scaling, Integrated system		
SNB capture	Can be calculated, High-speed NVMe 	Can be calculated, cross-checked with standalone benchmarks	Can be calculated, cross-checked with standalone benchmarks	Can be calculated, cross-checked with standalone benchmarks



Status matrix

Needs clarification

Partially available

Work is ongoing or done

Subsystem and their servers	List of components mapped to server specification needs	Methods for quantifying the resource needs	Tools to be developed tied to a list of methods	Test plan for measurements tied to a list of tools and method
DAQ Computing Infrastructure <u>Servers:</u> IPMI, Facility, DAQ SW	Yellow	Red	Red	Red
CCM <u>Servers:</u> CCM, Monitoring	Red	Red	Red	Red
Readout <u>Servers:</u> Readout	Green	Green	Yellow	Red
Dataflow <u>Servers:</u> Storage, DFO	Green	Yellow	Red	Red
Trigger <u>Servers:</u> Trigger MLT	Green	Yellow	Red	Red