

Multi-mission IT Infrastructure: evolution and challenges





- Historically, external contract providers defined discrete end-to-end Infrastructure for each mission
- Cumulative result of this approach:
 1. Numerous disparate systems with unique hardware and OS stacks
 2. Duplication of Infrastructure services e.g. DNS, Access Control etc
 3. Typically, systems significantly over-specified to accommodate worst-case growth assumptions
 4. Inefficient use of datacentre space and power consumption
 5. Many systems already obsolete at handover
 6. Difficult to maintain and secure
 7. No patching or obsolescence management approach included in system handover



- Evolve towards a common infrastructure architecture
 - Common platform and common environment
 - Default platform for any new deployments or obsolescence activity
 - Architecture to accommodate multiple use-cases e.g. virtual servers, physical servers, cloud & high-performance compute
- Direct the external contract providers to deliver into the EUMETSAT defined infrastructure environment
 - Focus the provider on the Application Facility Functional Delivery using the standard infrastructure architecture
 - Enable future scale-up / scale-down capability to encourage more accurate capacity estimates
 - Enable obsolescence management as part of long lead-time projects
- Resulting in
 - Simplified management of the Infrastructure Environment and the systems using it
 - Simplified and quicker delivery
 - Improved security management
 - Improved obsolescence management
 - Improved consumption efficiency of datacentre space and power



Multi-mission IT Infrastructure: Implementation progress

Generic Infrastructure Overview – Background and Evolution

Background

- EUM Ground Segment is built on top of IT infrastructure.
- Over the years, different programs and sub-segments contributed to its development, following a slightly different approach, and leading to a heterogeneous IT infrastructure stack.
- MME INF introduced standardisation for some IT Infrastructure components.

Evolution drivers and opportunities for improvement and simplification

- GS and IT Infrastructure Obsolescence
- MME services update and expansion



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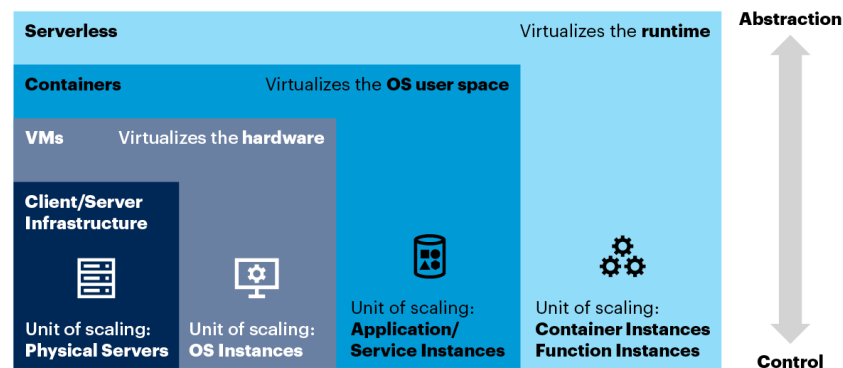




Multi-mission IT Infrastructure: Implementation Concepts

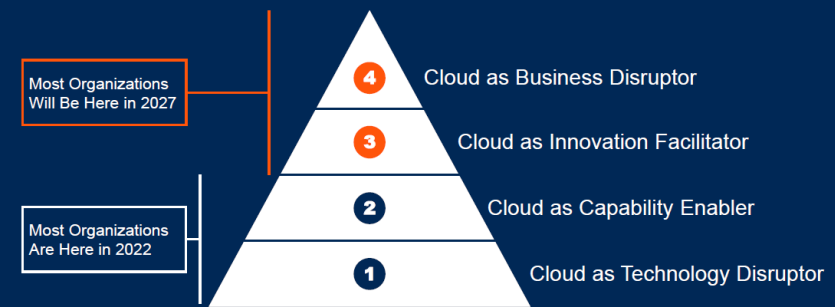
- Shifting to **as a Service provision** for the Infrastructure.
- MME IT Infrastructure Service Catalogue updated to provide **Computing Services**.
- Allowing EUMETSAT to **move** from mission specific computing facilities **to** multi-mission computing **“private cloud for internal users”**.
- Infrastructure delivery following industry trends, moving towards an **innovation facilitator**.

Evolution of Virtualization Methods and Their Infrastructure Abstraction Layers



Source: Gartner
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Cloud in 2027: From Technology Disruptor to Business Disruptor



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Multi-mission IT Infrastructure: Implementation Concepts

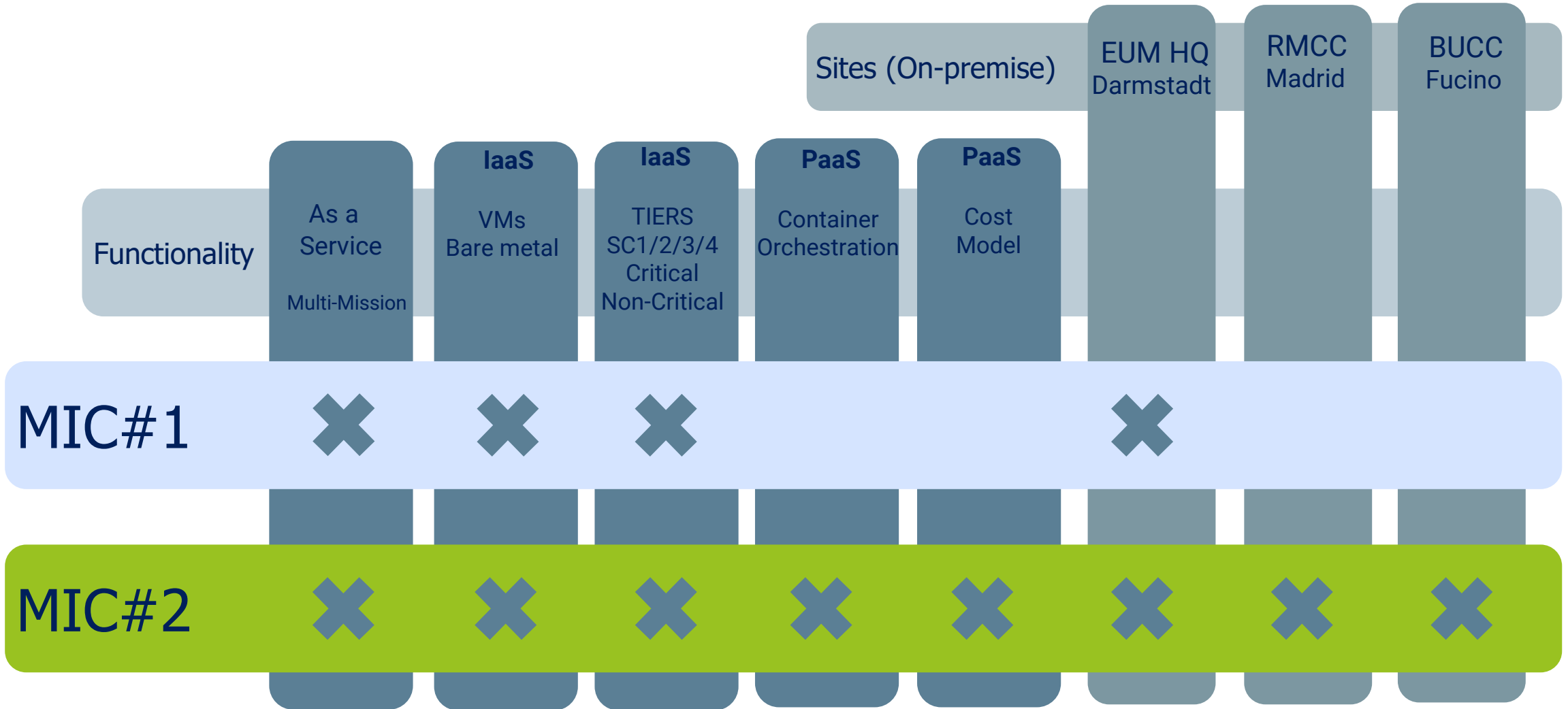
- The **MIC** system:
 - Supports **bare metal, virtual machines and containers**.
 - Provides computing resources in all **critical domains, environments and security classes**.
 - Relays on the **MME ITI services** (Comms, Storage, Security, Auxiliary, Build and Deployment).
 - Introduces **Infrastructure as Code**, automating build and deployment activities.

- The **MIC** system:
 - Can easily **scale-up** growing on capacity and provide new functionalities.
 - Introduces the **TIERs** concept to optimise the system resources utilisation.
 - Introduce a **cost model** to provide transparency.
 - Aligns the **IT infrastructure stack** to the ground segment criticality domains.



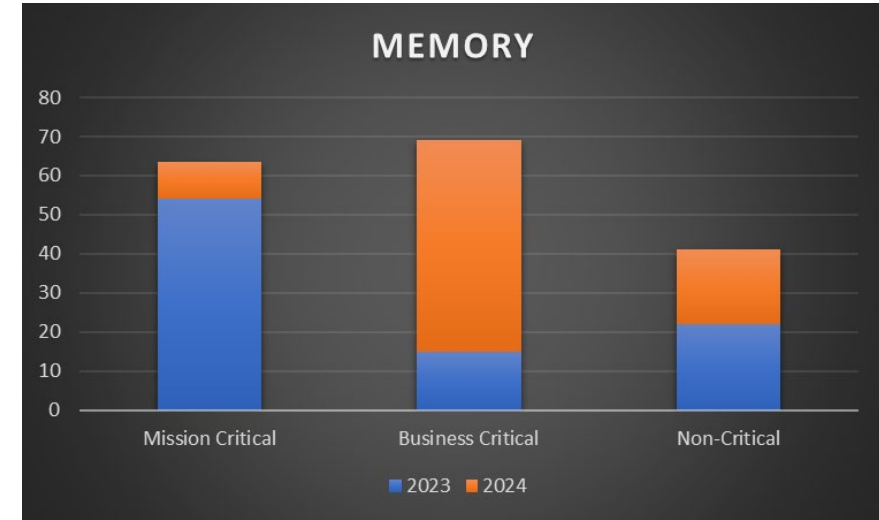
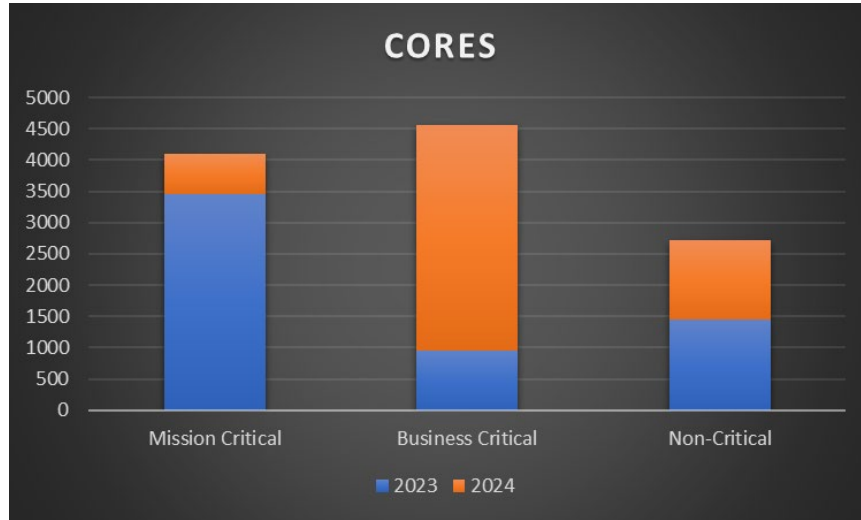


Multi-mission IT Infrastructure: Functionality





MIC **ready** to provide computing resources to operational workloads.



The MIC **shall be used by default** – as any other MME – by all new systems or by a current systems facing obsolescence, **avoiding the proliferation of computing silos.**



- **Ongoing Service Management**
 - Ideally require one provider to manage and maintain the full offering going forwards
 - Engaging now in Tender Process to define service provision for next +-5 years
- **Shift to Service Provision**
 - Mindset shift for everyone to Service Provision
 - Service Definitions required
 - Service Adoption guides required
 - Service delivery process to be defined and adopted
 - Significant service approach adoption overhead
- **Recent increase in high performance compute requirements**
 - forecasting a x10 factor increase in compute requirements
 - Driving Additional datacentre requirements external to EUMETSAT campus
 - Enabling better resilience with off-site deployments
 - **How best to scale?**
 - On-Prem Cloud for Virtual and fixed consumption hyper compute
 - External Cloud for High Elasticity workloads and rapid provisioning / prototyping
 - **Data Adjacency to Compute is significant in scale and non-trivial**