Joint Exposure of Network and Compute Information for Infrastructure-Aware Service Deployment

<draft-rcr-opsawg-operational-compute-metrics>

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Motivation (recap)

• Standardization of network information is quite mature but is in progress for compute information.

• There is a need to define a set of compute metrics to support various use cases being served in the IETF.

• Some ad hoc work exists in the IETF:
  • CATS (e.g., draft-du-cats-computing-modeling-description)
  • ALTO (e.g., draft-contreras-alto-service-edge)
  • OPSAWF (e.g., RFC 7666 MIB)

• Metrics are also defined in other bodies such as the Linux Foundation, DMTF, ETSI NFV, etc:
  • Raw compute infrastructure metrics (e.g., processing, memory, storage)
  • Compute virtualization resources and service quality metrics (e.g., VNF resources in VMs)
  • Service metrics including compute-related information (e.g., service delay, availability)
Problem space

Service Life Cycle:

New service → Service deployment → Service selection

Action to take | Information needed | Who needs it
--- | --- | ---
Service placement | Compute, Communication | Service provider

Service selection → Service assurance

Action to take | Information needed | Who needs it
--- | --- | ---
Service selection, Service Path selection | Compute, Communication | Network provider

For next version

Action to take | Information needed | Who needs it
--- | --- | ---
Service assurance (corrective actions) | Compute, Communication | Network provider

Application (client or proxy)
Relation to compute metrics in CATS (new slide)

- [draft-du-cats-computing-modeling-description-03] proposes 2 service-level metrics
  - Combined network delay and computing delay (same unit)
  - Server capacity in terms of e.g. sessions
    - Can be used for load balancing restricted to servers with acceptable combined delay
- [draft-rcr-opsawg-operational-compute-metric] focuses on compute metrics
  - Collected and defined at different levels of granularity
    - Depending on the service lifecycle action and information
  - Proposes 2 abstracted generic metrics reflecting server performance and policy-based cost
    - To accommodate need for simplicity and/or restricted information access
  - Addresses service deployment use-case that requires fine grain resources-level info
History and updates from IETF 119

- Draft presented in IETF 118 (-01) and IETF 119 (-03)
- Updates (now in -06 version)
  - Added new section for “Study of the Kubernetes Metrics API and Exposure Mechanism”
    - Understanding the Kubernetes Metrics
    - Example of How to Map the Kubernetes Metrics API with the IETF CATS Metrics Distribution
    - Available Metrics from the Kubernetes Metrics API
  - References to exposure solutions moved to a specific section
  - Editorial fixing
New section 7 on Kubernetes Metrics API

• To address deployment use-case and explore aggregation levels
• To see what can be used in CATS service selection
• 3 sections
  • Section 7.1 lists Kubernetes metric collection Architectures
  • Section 7.2 explores possible mapping with the CATS framework
  • Section 7.3 lists available Metrics from the Kubernetes Metrics API
    • Low-level (container, POD, Node)

• Low-level node resources description for selection are not needed for CATS service selection
  • They are for service placement and assurance
History and updates from IETF 119

• New version to be submitted during IETF 120 week
• Updates (in -07 version under preparation)
  • Consideration of Service Assurance phase for the service lifecycle (section 1)
  • Refinements on metric dimensions to be considered (section 6.5)
  • Editorial fixing
    • Re-wording and typo in section 7.1
    • Revise Table 6
Next steps

• Collect feedback from CATS WG
  • Feedback has been requested to the chairs and to the mailing list
  • Feedback expected today during IETF 120 CATS meeting

• Prepare new version for IETF 121
  • Potentially, to add further details on metrics from some existing solutions