

I2ICF for Data Center Networking: Use Cases and Framework

[draft-ywj-opsawg-i2icf-data-center-networking-00](#)

Kehan Yao (China Mobile)

Wenfei Wu (Peking University)

Jaehoon Paul Jeong (Sungkyunkwan University)

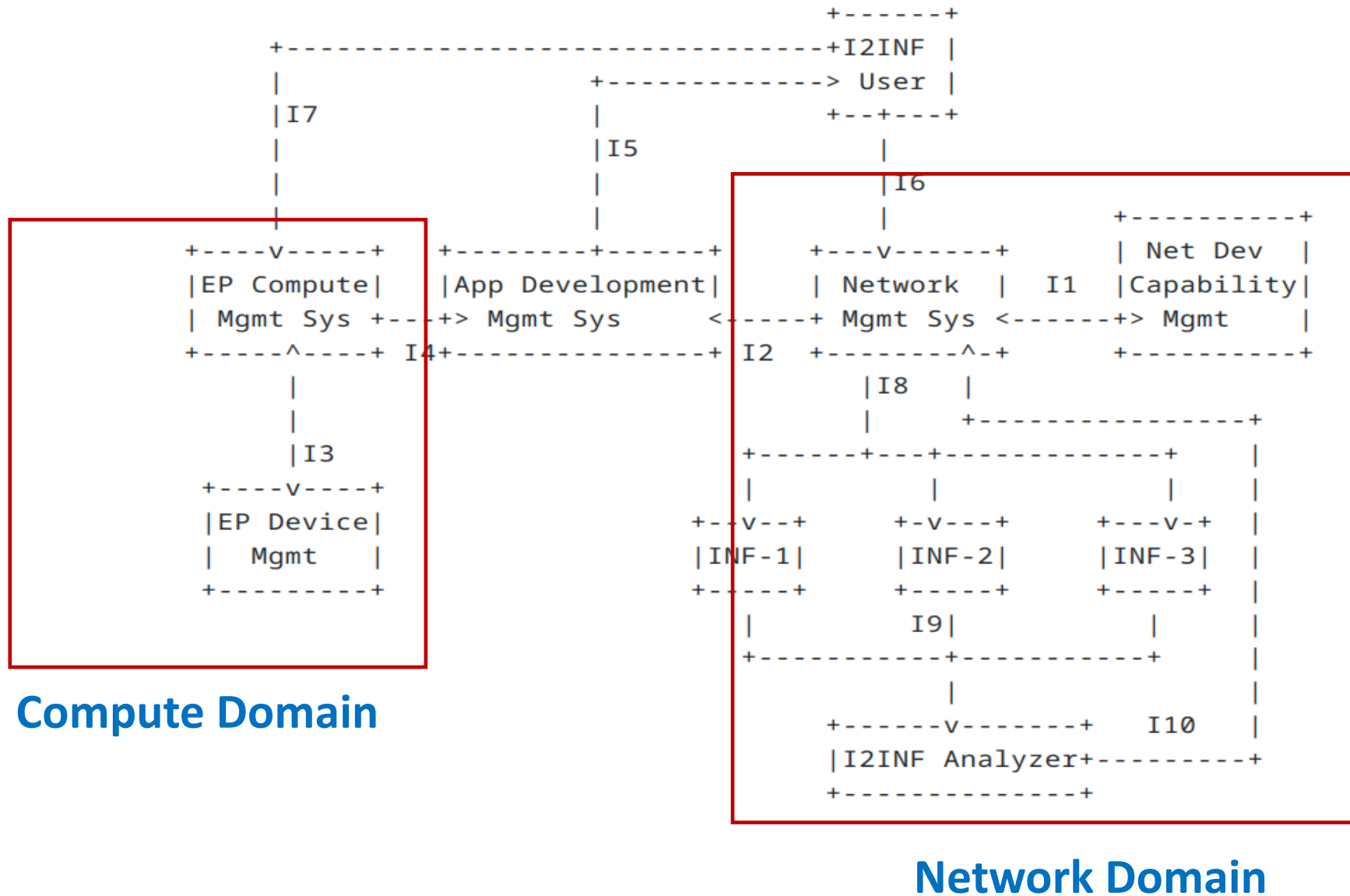
IETF 122, Bangkok

March 20, 2025

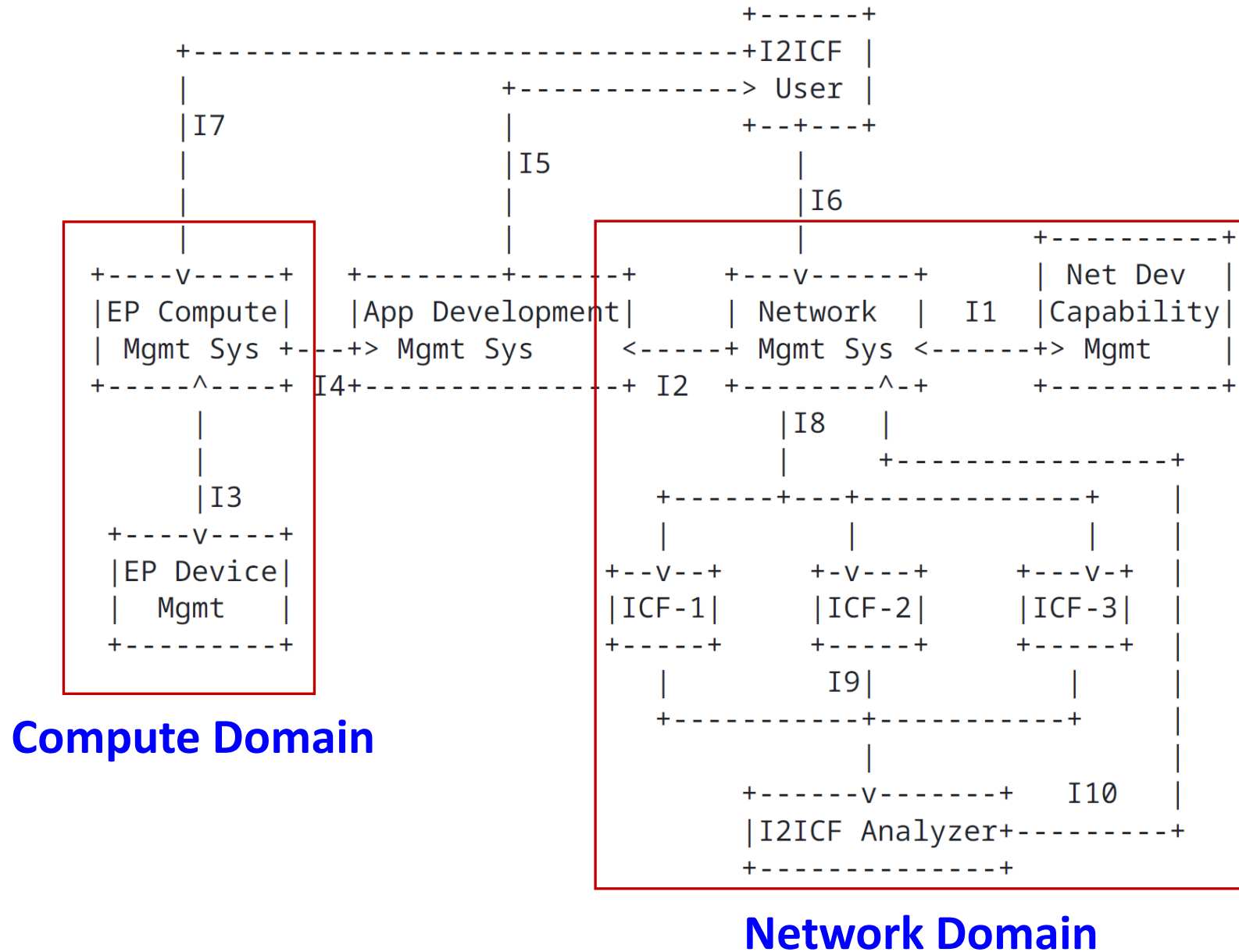
I2ICF Data Center Networking Applications

- Distributed Machine learning:
 - In-network aggregation for collective communication
 - In-network inference
- Big Data Analysis:
 - K-V aggregation
- Operations offloading for common distributed applications:
 - In-network caching
 - In-network lock management

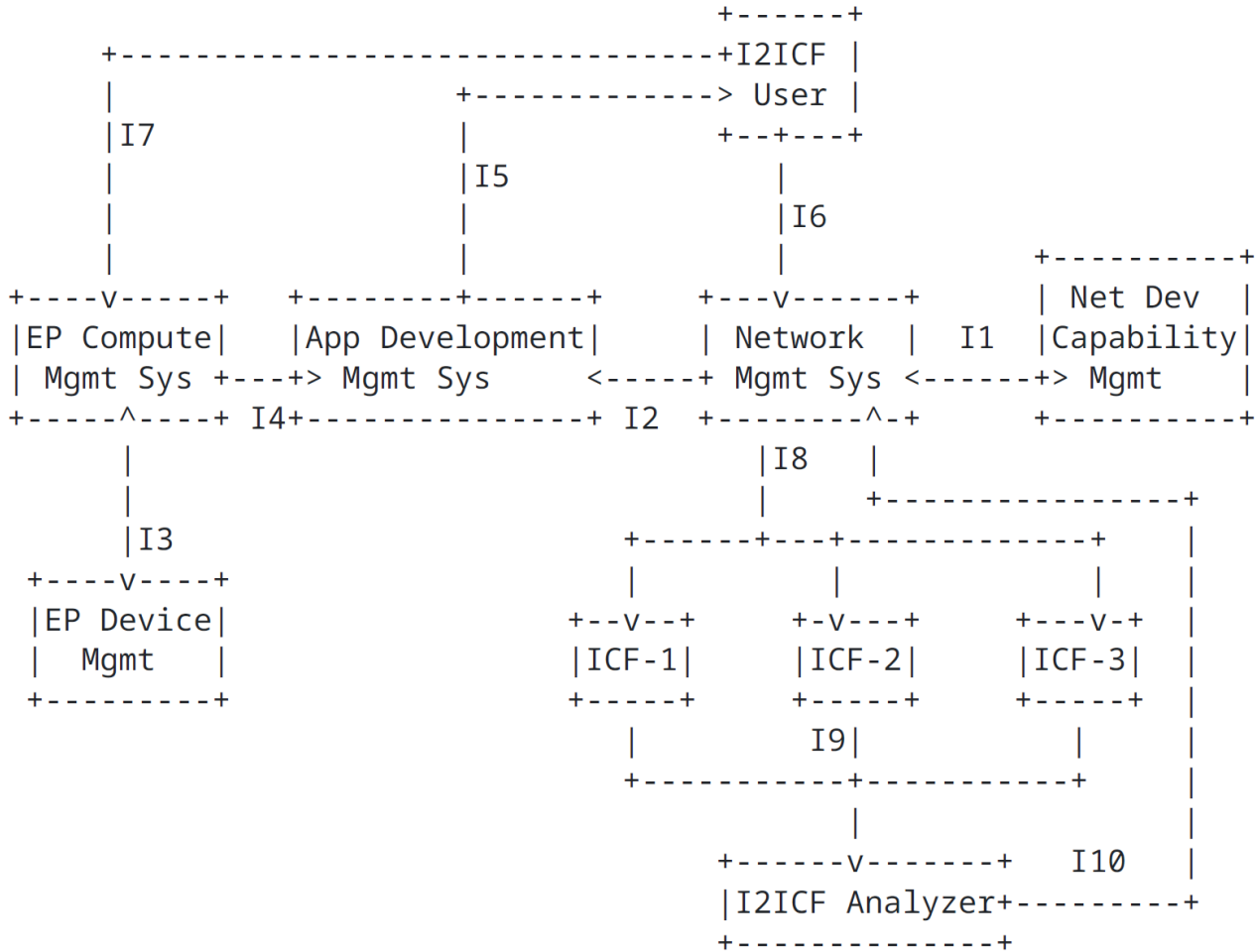
I2ICF Data Center Networking Framework



I2ICF Data Center Networking Framework

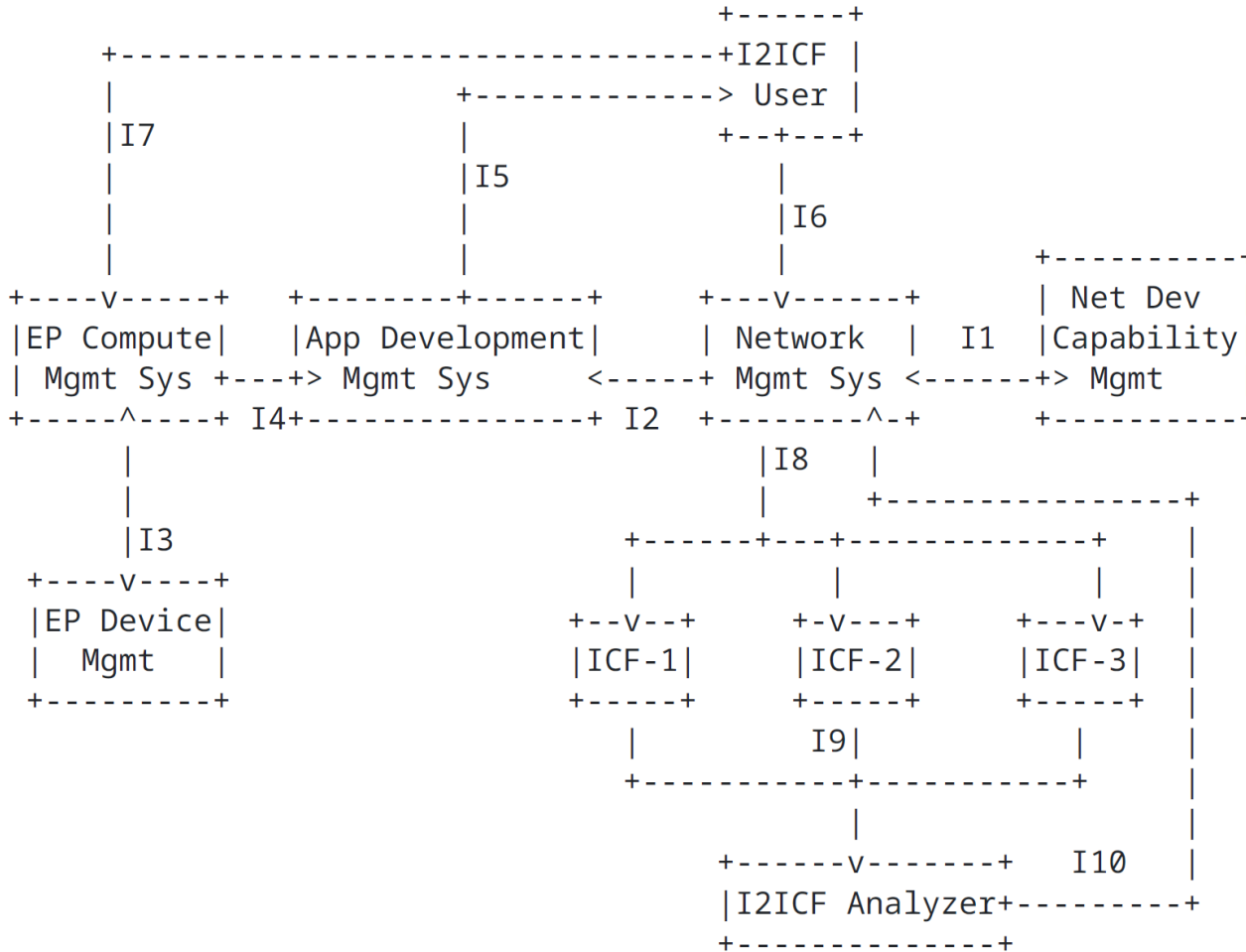


I2ICF Data Center Networking Interfaces



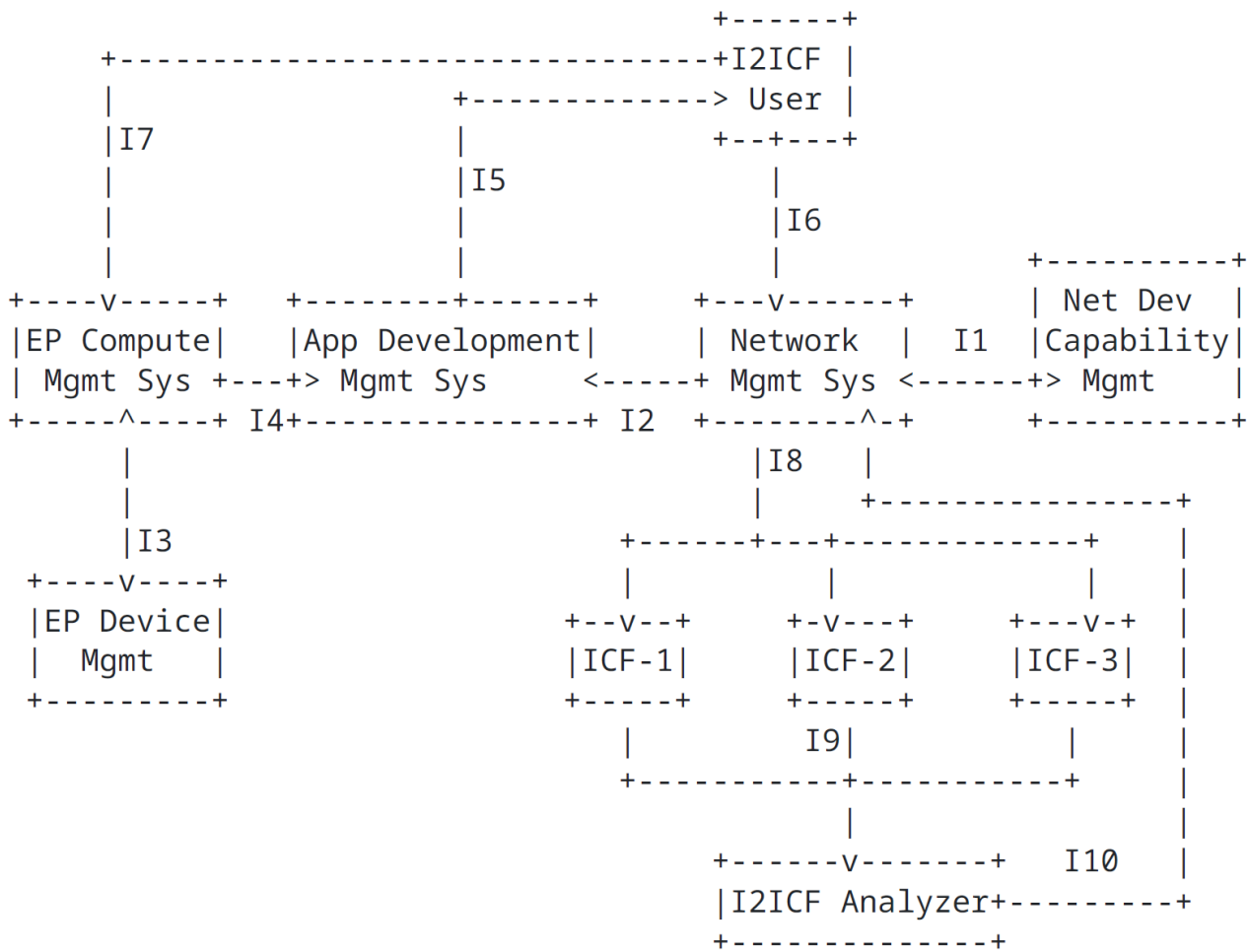
Interfaces	Meanings
I1	Registration interface between network device capability management system and network management system.
I2	In-network computing capabilities exposure interface

I2ICF Data Center Networking Interfaces



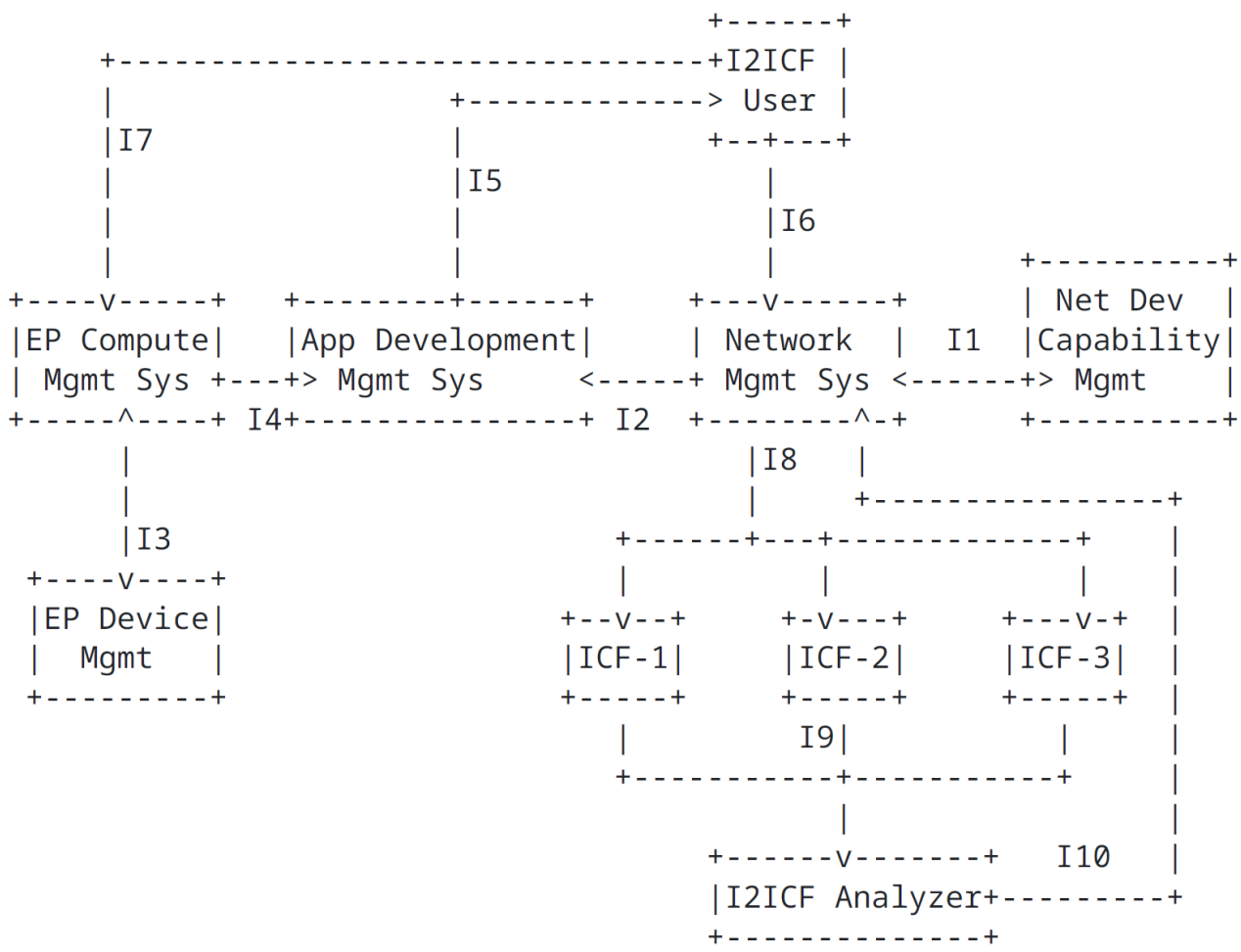
Interfaces	Meanings
I3	Registration interface of endpoint compute capabilities.
I4	Endpoint computing capabilities exposure interface

I2ICF Data Center Networking Interfaces



Interfaces	Meanings
I5	Notification interface from application development management system to the I2ICF user.
I6	Configuration interface from task management platforms to network management system.
I7	Configuration interface from task management platforms to the endpoint compute management system.

I2ICF Data Center Networking Interfaces



Interfaces	Meanings
I8	Configuration interface for ICFs with a low-level policy that is translated from a high-level policy.
I9	Monitoring interface via which monitoring data is collected from ICFs to I2ICF analyzer.
I10	Analytics interface via which policy reconfigurations or feedback information is delivered from I2ICF analyzer to the network management system.

Related Documents

- I-Ds:
 - draft-ywj-opsawg-i2icf-data-center-networking
 - draft-yao-tsvwg-cco-requirement-and-analysis
 - draft-yao-tsvwg-cco-problem-statement-and-usecases
- Paper from co-authors:
 - ClickINC: In-network Computing as a Service in Heterogeneous Programmable Data-center Networks, <https://dl.acm.org/doi/10.1145/3603269.3604835> **SIGCOMM 2023**
- Any comments?